BONNET PLUME

CANADIAN HERITAGE RIVER MANAGEMENT PLAN

Government of Yukon

in association with

Government of Canada

Mayo and District Renewable Resources Council

February 1998

This Management Plan provides the operational framework for partnership action to achieve the goals and principles described herein. We, the undersigned, support the designation of the Bonnet Plume River as a Canadian Heritage River.

Chief, Nacho Nyak Dun First Nation — Date: JAN 1/98

Chair, Mayo Renewable Resources Council — Date: JAN 6/98

Minister, Department of Renewable Resources, Yukon — Date: Jan 9/98

Minister, Department of Indian Affairs and Northern Development — Date: Feb. 2/98

Minister, Department of Canadian Heritage — Date

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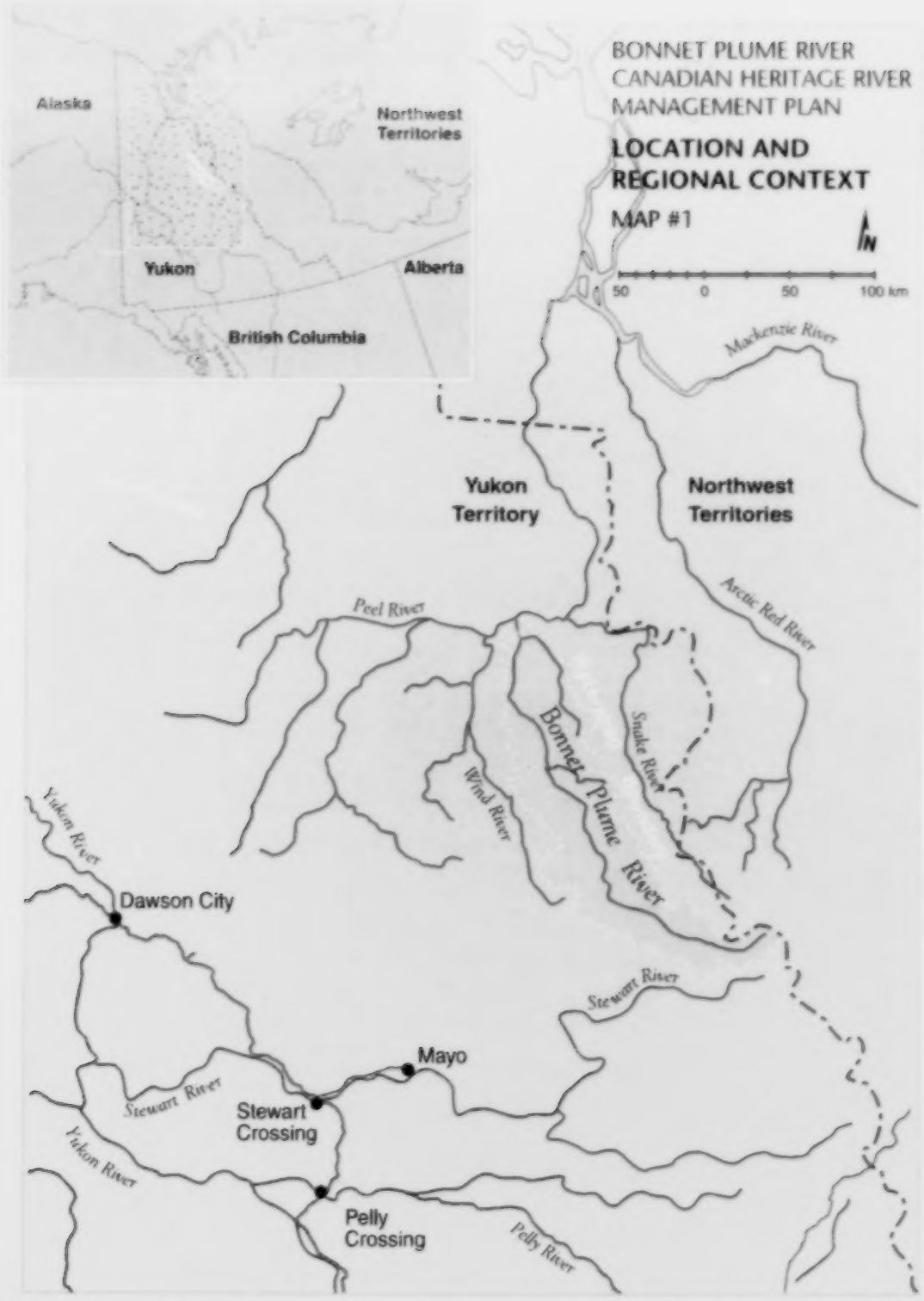

BONNET PLUME RIVER
CANADIAN HERITAGE RIVER
MANAGEMENT PLAN
LOCATION AND
REGIONAL CONTEXT
MAP #1
N
50 0 50 100 km
Alaska
Northwest Territories
Yukon
Alberta
British Columbia
Mackenzie River
Yukon Territory
Northwest Territories
Peel River
Arctic Red River
Snake River
Wind River
Bonnet Plume River
Yukon River
Dawson City
Stewart River
Mayo
Stewart River
Stewart Crossing
Yukon River
Pelly Crossing
Pelly River

BONNET PLUME HERITAGE RIVER MANAGEMENT PLAN

Executive Summary

In January 1993, the entire Bonnet Plume River watershed was nominated to the Canadian Heritage Rivers System (CHRS) by the Government of Yukon, Indian and Northern Affairs Canada, and the Mayo District Renewable Resources Council (MDRRC). The MDRRC is the renewable resources forum established by government and the Nacho Nyak Dun First Nation within their traditional territory. The nomination fulfills an obligation under the First Nation of Nacho Nyak Dun (NND) Final Agreement to protect the river's heritage values.

The management plan applies to the entire drainage basin (approximately 12,000 sq. km), from the headwaters to the junction of the Peel River 350 kilometres to the north-west (Maps 1 &2). In addition to meeting the management obligations required by the CHRS nomination, the NND Final Agreement directs that the management plan shall:

"establish the boundaries of the river management area and may address all matters relating to the development, management and use of the Bonnet Plume River, including:

- conservation and management of natural and human heritage resources;
- recreational use;
- water quality and waste management; and
- public information and interpretation.

The preparation of the plan shall include a process for public consultation."[1]

A Steering Committee consisting of two members of the Mayo District Renewable Resources Council, and one member each from the federal and territorial governments has overseen plan preparation. A stakeholder Advisory Committee (Appendix 1) was established to provide an opportunity for direct input into the planning process and advise the Steering Committee.

The management plan respects the provisions of the Nacho Nyak Dun and the overlapping Tetlit Gwich'in First Nations' Land Claim Agreement and the principles of the Canadian Heritage Rivers System.

The Plan provides a framework for future watershed management and decision making. It includes a work program that outlines the roles and responsibilities, co-operative working arrangements, issues, information gaps, tools and actions that need to be considered to manage resource use effectively.

The plan's goals and objectives will be achieved within existing federal and territorial legislation and their regulations[2] (Appendix 2), as they apply to settlement and non-settlement lands. CHRS status itself does not have legislative powers to protect the watershed's resources, but rather relies on other mechanisms such as land use planning and development assessment to determine land use suitability and the limits of acceptable change.

Education and voluntary compliance will be encouraged where legislation or land claims agreements do not provide the authority to regulate.

[1] Nacho Nyak Dun Final Agreement, May 29, 1993 p.16/5

[2] For example, the *Yukon Waters Act*, the *Fisheries Act*, the *Territorial Lands Act* and *Land Use Regulations*, the *Yukon Quartz Mining* and *Placer Mining Acts*, and the *Territorial Environment* and *Wildlife Acts* (see 6.2 Appendix 2).

The Bonnet Plume River (YTG)

"Stakeholder objectives differ substantially, ranging from wilderness preservation and full area protection to preserving the opportunity for multiple use and resource extraction. These conflicting objectives will be debated and considered in various public consultation processes as provided for in existing legislation." –Steering Committee Member

Agency policies, procedures and work program priorities will need to be adjusted to facilitate inter-agency cooperation and reflect the mutually agreed upon principles and objectives of this Heritage River Management Plan.

The recommendation to include the entire watershed in the management plan and use the Canadian Heritage Rivers designation as the mechanism for implementation, reflects two aspirations of the Nacho Nyak Dun First Nation. The first is to recognise the inheritance value[5] of the Bonnet Plume River and watershed, and the First Nation's desire to use and manage this legacy in a sustainable manner. The CHRS designation provides the co-operative management mechanism to achieve the "higher duty of care" desired by First Nations, Canada and the Yukon government.

The second objective is to ensure the Mayo District Renewable Resources Council plays a direct role in providing local-level input into subsequent decision making. The MDRRC has been identified by the Steering Committee as the most appropriate forum for this purpose. It has the mandate to work with government on renewable resource management issues in the region and includes a mechanism in its structure to accommodate the trans-boundary land claim obligations to the Tetlit Gwich'in. Both federal and territorial governments recognise that a river management partnership requires more local input into decision making and accept the MDRRC role in a tripartite partnership with respect to Bonnet Plume watershed management.

The overall objectives for managing the river from a CHRS nomination perspective are:

1) to conserve the river's natural and human heritage values;

2) allow for interpretation of these heritage values; and

3) provide recreational and heritage appreciation opportunities.

These CHRS objectives do not preclude a multiple-use environment.

The specific focus of this resource management plan is to meet the management planning requirements associated with CHRS designation; thus it favours conservation objectives. An additional factor is the NND rationale for designation, that is, a desire to protect their "inheritance value". Heritage River status is viewed as a means to ensure full local participation in watershed use and management decision-making.

Similarly, the mining community is not opposed to CHRS status provided it does not create additional rules which limit their exploration and development rights. Both recognise a "higher duty of care"[6] approach is implied with this designation.

The presence of significant mineralisation in the heart of the drainage basin has been confirmed and must be acknowledged. Unless mining exploration and development rules change, nothing in the management plan limits further mineral exploration or precludes the possibility of development of potential mining opportunities. However, as explained earlier, the decision of the parties to the NND Final Agreement to sponsor CHRS designation through that land claim settlement carries with it an expectation for a "higher duty of care". Both area land claims also include a constitutionally entrenched provision regarding protection of water quality, quantity and rate of flow, that may affect all proposed land use activity within the Bonnet Plume watershed. This provision should ensure the primary heritage values for which the river has been nominated are not compromised over the long term.

There is insufficient information available to prepare a regional land use plan at this point in time. Thus a priority objective of the management plan is to enhance the quality and quantity of resource information to facilitate such long range planning. When regional land use planning for the entire Peel River drainage basin is undertaken, the Heritage River Management Plan can contribute to this broader, long term objective.

[5] "Inheritance value" refers to the perspective and philosophy of First Nations that land has both intrinsic and use values, and that the responsibility for the care of the land is passed down from each generation.

[6] see page 21, section 1.4.2 for a discussion of the meaning of this term.

The First Nation is not opposed to considering a range of land use activities within the watershed, nor do they wish to preclude any specific development opportunities in the Bonnet Plume watershed at this time. Should a proposal threaten the integrity of their inheritance, the Nacho Nyak Dun caution that they are quite prepared to recommend to government that a specific project not proceed.

This management plan explains the natural and cultural heritage values of the watershed which must be protected to meet CHRS standards. It defines both the knowledge required to improve decision making as well as the circumstances which should trigger management intervention to ensure CHRS objectives are sustained. It includes a specific work program identifying what actions are required, by whom, and when, to meet plan objectives.

Management objectives for **natural heritage resources** include identification and protection of: fish habitat; rare and endangered species/special features; vegetation; water quality; wilderness; and wildlife resources. Additional baseline studies are recommended for all of these resources since current information is incomplete for comprehensive integrated resource planning and long term management purposes. The available data is sufficient however, to support the river's nomination to the CHR system in the Yukon context.

The Nacho Nyak Dun and Tetlit Gwich'in First Nations have a long-standing history of use of the Bonnet Plume watershed. The plan calls for these rich **cultural heritage resources** to be documented, protected and respected in management decision making. The plan recognises the inheritance values of the Bonnet Plume watershed and supports the continuation of traditional uses.

The plan acknowledges the outstanding water and land-based **recreation and tourism resources** of the Bonnet Plume watershed. Visitors can discover and experience a distinctive Yukon ecoregion and wilderness river. Wildlife populations have supported a long history of hunting and trapping activity. Rafting, canoeing, hiking and wildlife viewing opportunities also abound.

The management plan provides a framework for co-ordination and co-operative action.

Wernecke Mountains (B. Downie)

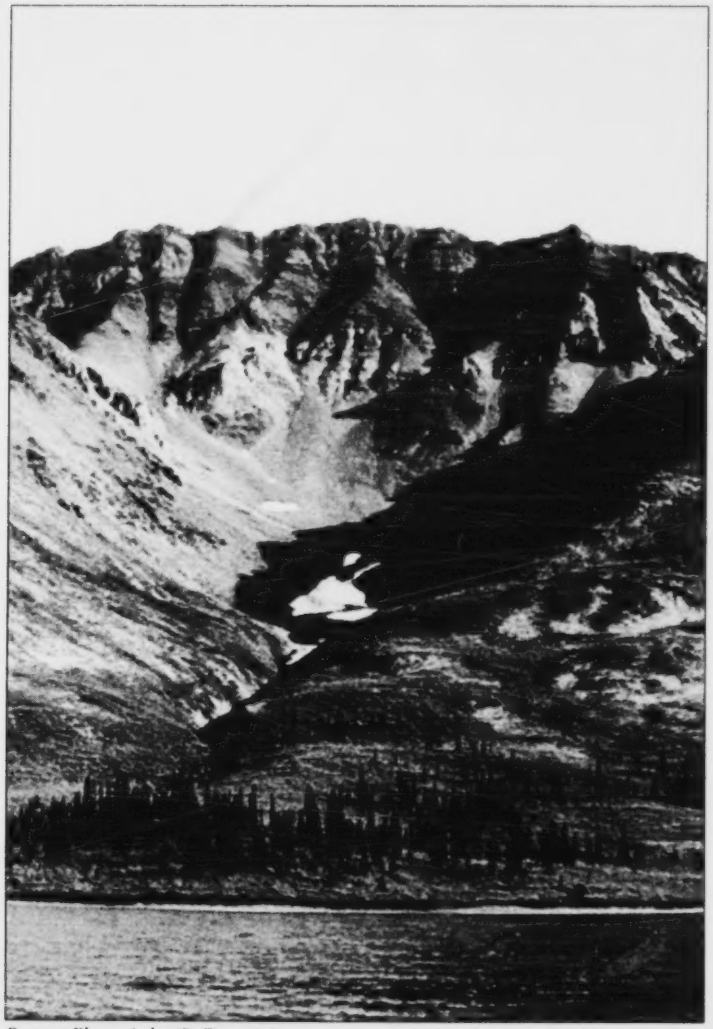
"That Bonnet Plume, that's clean water. Pure. Good fishing there."

–Sam Peter

The objective is to provide visitors with high quality opportunities for wildland recreation in a sustainable manner. The benefits of such tourism and recreation activity should accrue as much as possible to regional residents.

Eleven main management issues are discussed ranging from the promotion of biodiversity and protection of wilderness values to the adequacy of current resource information.

Any economic development must be managed to conserve values basic to the Canadian Heritage River designation. Economic activities need to be compatible with resource objectives, with environmental impacts minimised. The Bonnet Plume watershed contains a number of existing and potential economic development opportunities which have implications for watershed planning and development. The settlement of land claims also establishes economic development obligations which need to be considered in planning and management. Such land claim settlement obligations require a different management regime than would be found in southern Canada. Economic values include the inherent value of wildlands as well as the development opportunities associated with adventure travel, outfitting and minimal resource extraction.



Bonnet Plume Lake (B. Downie)

The management plan suggests research is needed to define the limits of acceptable change in terms which can be measured against baseline conditions.

This management plan includes a 5-year workplan which identifies work priorities, agency responsibilities, key steps to be taken and anticipated outcomes. As the initial management plan, it focuses on resolving information gaps and building a cooperative management regime for the watershed as a whole.

1.0 INTRODUCTION AND BACKGROUND

1.1 Purpose of Canadian Heritage Rivers System

The Canadian Heritage Rivers System (CHRS) is a co-operative program, established in 1984, to give national recognition to rivers which have outstanding natural and human heritage values, and provide significant recreational opportunities. The program objectives include:

- raising public awareness of a river's heritage values,
- seeking recognition of the need for integrated resource management to preserve such values, and
- ensuring a river management plan is prepared to that end.

The CHRS program is administered by federal, provincial and territorial governments in association with First Nations, local communities, and interest groups. Federal, provincial, territorial and First Nation governments which participate in the establishment and administration of a Canadian Heritage River retain their traditional jurisdictional powers. This includes ownership of the land, the choice to nominate a river to the system, and the right to continue to operate and manage designated rivers in accordance with the objectives of the system.

1.2 First Nation Land Claim Settlement Obligations

The Nacho Nyak Dun and Tetlit Gwich'in First Nations land claim agreements have been finalised. Both First Nations have land selections and management rights within the Bonnet Plume watershed **(Map 3)**. The following provides an introduction to the agreements and highlights the sections applicable to CHRS designation. Various committees and boards are to be formed as a result of these agreements. They can all contribute to the management of the Bonnet Plume watershed's natural and cultural resources, and influence its use and development.

1.2.1 Nacho Nyak Dun First Nation

In May, 1993, the Government of Canada together with the Government of Yukon and the First Nation of NND signed the First Nation of Nacho Nyak Dun Final Agreement (FNNNDFA), including an implementation plan. This constitutionally protected agreement became effective February 14, 1995.

Chapter 13, Schedule B, Sections 2.1-2.3 of the FNNNDFA states that:

- Government shall submit to the Board (CHRS) a nomination document for the Bonnet Plume River before January 31, 1993, or as soon as practical thereafter.
- Government, after consultation with the Mayo District Renewable Resources Council, shall prepare the nomination document in accordance with the Canadian Heritage Rivers System program.
- The Board (CHRSB) shall consider the nomination; and make a recommendation to the Ministers, in accordance with the provisions of the Canadian Heritage Rivers System program.

Schedule B outlines the planning process to be followed. It provides direction concerning the establishment and makeup of a Steering Committee to oversee preparation of the management plan, and includes guidelines concerning the content, boundaries and approach to be used in preparation and review. Schedule B of the FNNNDFA is presented in **Appendix 3**.

The NNDFA designates the Mayo District Renewable Resources Council as the primary forum for making recommendations to the appropriate body on matters relating to conservation of fish and wildlife within NND traditional territory. Its primary focus is on fish and wildlife management. The Council comprises 6 members: three nominated by the Nacho Nyak Dun First Nation and three nominated by the Yukon Minister of Renewable Resources. The Council comprises half of the members of the Bonnet Plume Steering Committee (as required in the Nacho Nyak Dun Final Agreement). The Steering Committee has reviewed this management plan and supports presenting it to the Ministers for approval.

It should be noted that when the Council is exercising powers and responsibilities within the Tetlit Gwich'in Primary Use Area in the Yukon, the three members nominated by the Nacho Nyak Dun First Nation are replaced by three members representing the Tetlit Gwich'in.

The FNNNDFA also provides an opportunity for future establishment of a Regional Land Use Planning Commission to oversee preparation of a regional land use plan.

1.2.2 Tetlit Gwich'in First Nation

The Gwich'in Comprehensive Land Claim Agreement was signed April 22, 1992, by the Gwich'in Tribal Council, the Government of Canada, and the Government of the Northwest Territories. This Agreement became effective in December 1992. The settlement legislation includes certain trans-boundary rights in the Yukon. Within their traditional territory, the Tetlit Gwich'in have title to 1,544 sq. km (approximately 600 square miles) of land in the Yukon. Some of their titled land is within the Bonnet Plume watershed (see **Appendix 4** for legal description).

The Gwich'in Comprehensive Land Claim Agreement calls for the creation of a number of management boards. Of interest to heritage river management was the creation of the Peel River Watershed Advisory Committee in 1994 with a two year term. This Committee was mandated to:

- consider and make recommendations respecting the establishment of a water management agreement for the Peel River watershed,
- consider and make recommendations respecting the establishment of a regional land-use planning commission (or similar agency)for any area which includes the Peel River watershed; and
- consider and make recommendations regarding the need for, and establishment of Special Management Areas in the Peel River watershed.

This Committee included three representatives from the Nacho Nyak Dun First Nation, three from the Tetlit Gwich'in, and two each from the governments of Canada, Yukon and the Northwest Territories. The Committee completed it's mandate in March 1996. The Committee concluded more additional baseline watershed research was needed for planning and development assessment purposes. This management plan responds to that direction.

1.3 Bonnet Plume Heritage River Nomination

The Bonnet Plume River was one of seven Yukon rivers recommended as potential CHRS candidates (Juurand and Associates, 1987)

1.3.1 History of the CHRS Program in the Yukon

The Government of Yukon, Department of Renewable Resources, has been a participant in the CHRS program since its inception in 1984. A systems framework study was initiated in 1987 (Juurand and Associates 1987) with a CHRS System Plan completed in 1988 (PRP Parks: Research & Planning Inc.) This system study reviewed a total of 77 Yukon rivers, assessing their natural and cultural heritage resources and recreational potential. In the final stage of study, other factors including geographic region representation, theme representation, river morphology, navigability and land-use compatibility were used to determine final river rankings. The Bonnet Plume River ranked among the top candidates for CHRS status.

1.3.2 Bonnet Plume Planning Process

The Bonnet Plume River drainage was identified as an important area deserving special management during the negotiations of the Nacho Nyak Dun Final Agreement. The negotiators agreed CHRS designation might be the appropriate management designation to meet this objective. Government agreed to submit a nomination. Once the nomination was accepted, a 'Steering Committee' was established with members from the Mayo District Renewable Resources Council, Yukon Parks, Parks Canada and DIAND. A background study was commissioned (PRP Parks: Research & Planning Inc. 1992a) which confirmed the Bonnet Plume River could meet the CHRS nomination criteria. The consultants also indicated there were significant data gaps which could impede subsequent management planning.

Available information concerning the Bonnet Plume River was reviewed. Knowledgeable individuals, including outfitters, hunters, trappers and mining geologists, with personal experience in the area were contacted. Preliminary consultation meetings were held in Mayo with the Nacho Nyak Dun First Nation and with other community members. Members of the Tetlit Gwich'in First Nation in Fort McPherson were also consulted during preparation of the nomination report. Industry expressed concern that as stakeholders, they were not adequately consulted during the initial stages of the nomination process. The Steering Committee agreed to respond to this concern.

A formal nomination document was subsequently prepared and signed by the Yukon Minister of Renewable Resources, Chair of the Mayo District Renewable Resources Council and the Minister of Indian Affairs and Northern Development.

The CHRS Board approved the nomination in January, 1993. The approval required completion of a management plan within three years. An extension was granted in the fall of 1995. A Steering Committee consisting of two members of the Mayo District Renewable Resource Council, and one member from each of the federal and territorial governments (DIAND Water Resources and Renewable Resources, Parks & Outdoor Recreation Branch) were assigned to oversee plan preparation.

The Steering Committee hired Trans Northern Ltd. to design a 'Consultation Process' for stakeholders interested in participating in the preparation of a management plan for the Bonnet Plume watershed. The consultation process was designed to provide opportunities to review background materials, submit new information and identify issues. In addition, it was mandated to generate recommendations for river management including refining the ultimate boundaries for the CHRS designation.

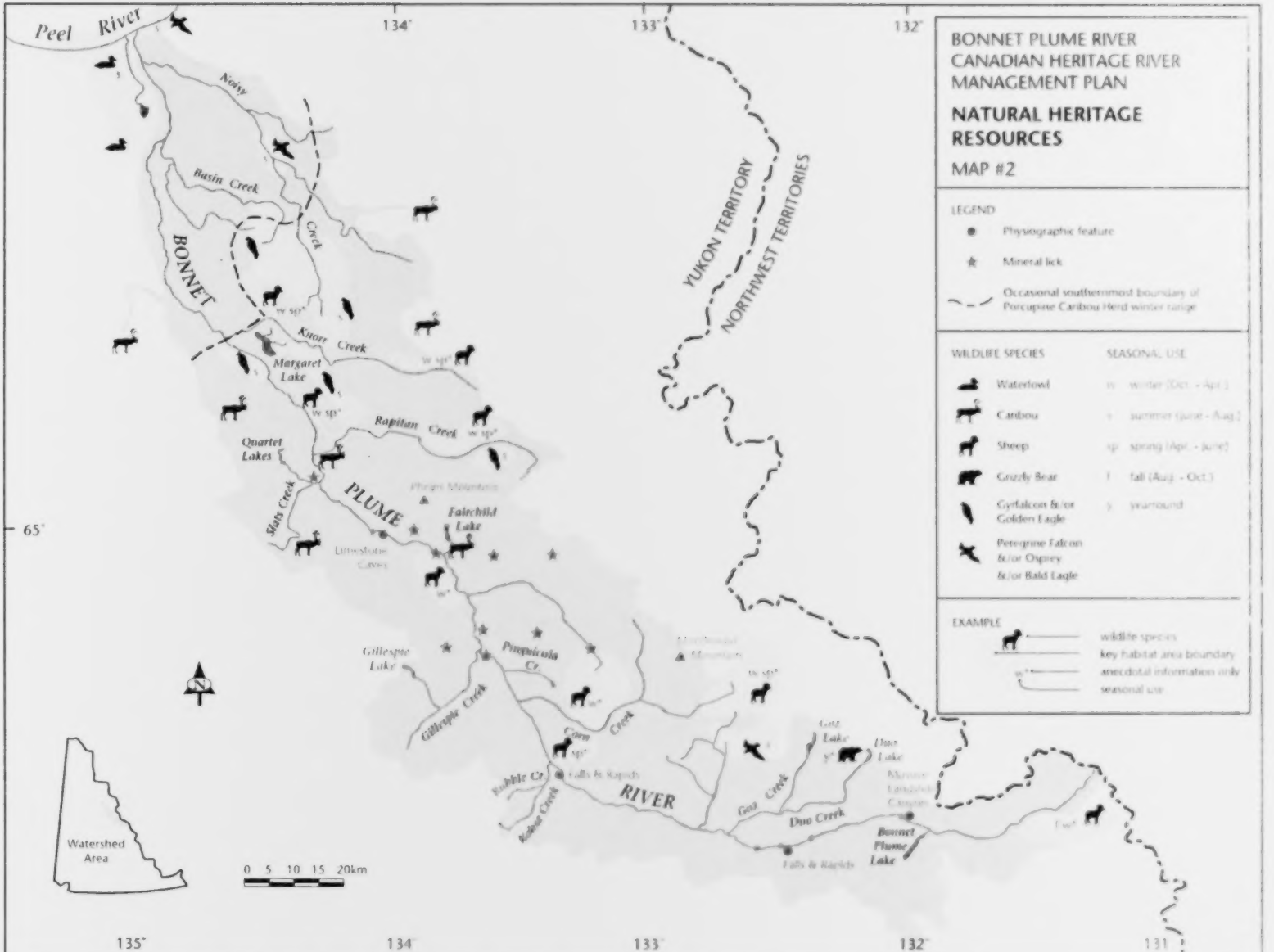
A stakeholder Advisory Committee was also formed in March 1994 to give advice to the Steering Committee and provide an opportunity for direct input into the planning process. Representation was invited from the following organisations: First Nation of Nacho Nyak Dun, Tetlit Gwich'in, Canadian Parks and Wilderness Society, Friends of Yukon Rivers, Yukon Chamber of Mines, Klondike Placer Miners Association, Westmin Resources Limited, Pamicon Developments Limited, Widrig Outfitters Ltd., Bonnet Plume Outfitters, Yukon Wilderness Tourism Association, Yukon Conservation Society, the Yukon Trapper's Association, and the villages of Mayo and Elsa/Keno.

The objective of the 'Advisory Committee' was to identify management objectives that reflected the interests of all stakeholders while protecting CHRS values in the Bonnet Plume River. Management objectives for ten different resources were discussed by the 'Advisory Committee' during four meetings held from March to October, 1994. The 'Steering Committee' used this input to prepare a draft 'Management Plan'.

The draft management plan was prepared by Yukon government staff and circulated to stakeholders for review and comment. It was hoped that this process would lead to stakeholder consensus but this was not the case. In particular, conservation and mining interests remained polarised. This was reflected in the comments received on the draft document.

The Steering Committee considered the comments received and, on the advice of the Advisory Committee, hired an independent consultant to prepare a second draft. The consultant was directed to incorporate the comments and reflect the role of First Nations and the MDRRC in plan development and implementation. The revised document was not to be a land use plan. It was to focus on identifying the specific actions needed and partnerships required to meet the objectives for which the Bonnet Plume River was nominated. The Steering Committee wanted the final management plan to include a 3-5 year work program. This would identify what needed to be done and by whom, explain how data gaps would be resolved, and how MDRRC and First Nation input into resource management decisions would occur.

Before being presented to the CHRS Board, the final *Bonnet Plume Heritage River Management Plan* must be signed off by the Mayo District Renewable Resources Council and approved by the Federal Minister for Indian and Northern Affairs, and the Territorial Minister for Renewable Resources.


Peel River
Noisy
Basin Creek
BONNET
Creek
Knorr Creek
Margaret Lake
Rapitan Creek
Quartet Lakes
Slats Creek
PLUME
Fairchild Lake
Limestone Caves
Gillespie Lake
Gillespie Creek
Pingo Peninsula Cr.
Corn Creek
Rabbit Cr.
Rabbit Creek
RIVER
Goz Creek
Duo Creek
Duo Lake
Bonnet Plume Lake
Falls & Rapids
YUKON TERRITORY
NORTHWEST TERRITORIES
134°
133°
132°
131°
135°
65°
Watershed Area
0 5 10 15 20km
BONNET PLUME RIVER
CANADIAN HERITAGE RIVER
MANAGEMENT PLAN
NATURAL HERITAGE RESOURCES
MAP #2
LEGEND
Physiographic feature
Mineral lick
Occasional southernmost boundary of Porcupine Caribou Herd winter range
WILDLIFE SPECIES
SEASONAL USE
Waterfowl
Caribou
Sheep
Grizzly Bear
Gyrfalcons &/or Golden Eagle
Peregrine Falcon &/or Osprey &/or Bald Eagle
w winter (Oct. - Apr.)
s summer (June - Aug.)
sp spring (Apr. - June)
f fall (Aug. - Oct.)
y yearround
EXAMPLE
wildlife species
key habitat area boundary
anecdotal information only
seasonal use

1.3.3 CHRS Management Plan Requirements

To qualify for inclusion in the Canadian Heritage Rivers System, a river, or section of river, must have features of outstanding Canadian significance in one or more of the following areas: natural heritage, cultural heritage, recreation and tourism, or general integrity values. The nominated section should be large enough to encompass these values, safeguard their integrity, and provide the user with an appreciation of the river's resources, as well as an enjoyable recreational experience. Each of the four CHRS selection guidelines (1990) are presently met by the Bonnet Plume River and its drainage basin. The following sections summarise the Bonnet Plume watershed's heritage, use and natural integrity values, which formed the basis for its CHRS nomination. *(For more detail, refer to the Background Study and Nomination document).*

1.3.3.1 Natural Heritage Values

The natural heritage values of the Bonnet Plume River are the primary reason for its nomination to the CHRS (PRP Parks 1992b). The Bonnet Plume watershed possesses a wide variety of natural characteristics that are both representative of the regional landscape evolution and significant in terms of their uniqueness, quality or abundance **(Map 2)**.

Several outstanding features of the area reflect an evolutionary history extending back to the late Precambrian period. Complex and repeated tectonic events have created a unique, composite physiographic and structural depression in the northern Canadian Cordillera. This depression (also known as the Bonnet Plume Basin) covers an area of approximately 322 square kilometres and forms the lower (northern) portion of the watershed. The Basin is underlain by Tertiary aged sedimentary rocks containing lignite coals in the north, and by Cretaceous aged sedimentary rocks containing bituminous coals in the south. The thickest and most extensive coal deposits in the Yukon extend from the Wind River through the Bonnet Plume watershed towards the confluence of the Peel. Duck-billed dinosaur remains have also been discovered in the Basin in the vicinity of the Bonnet Plume-Peel River confluence.

Natural Heritage Guideline:

The river is an outstanding example of a river environment affected by the major stages and processes in the earth's evolutionary history present in Canada. This would include rivers which best represent the major periods of geological time in which the surface of the earth underwent major changes and stream modification.

–CHRS Nomination Guidelines

Upper Bonnet Plume River (B. Downie)

Natural Heritage Guideline:

The river is an outstanding representation of significant ongoing fluvial, geomorphological and biological processes. As distinct from the periods of the earth's development, this focuses upon ongoing processes in the evolution and form of the river and its associated plant and animal communities;

–CHRS Nomination Guidelines

The Basin contrasts sharply with the upper (southern) sections of the watershed. The latter consists of uplifted metamorphic and sedimentary rock structures where three mountain systems, the Wernecke, Richardsons and Mackenzies meet. Glacial landforms such as aretes, cirques and moraines are evidence of Laurentide glaciation in the area. A proliferation of rock glaciers occur in the watershed's many valleys and low-lying areas and extend to mid-slope levels.

Like the evolutionary history evident in the river valley, the on-going processes of landscape development, such as glacial, fluvial and biological processes, may also be observed in the Bonnet Plume watershed. Scree slopes, avalanche paths, braided gravel bars, hoodoos, and stream deltas are examples of the geomorphological processes present. One of the most outstanding geomorphic features is the massive landslide feature in the upper reaches of the river through which the river has carved a major canyon.

More recently, large scale mass wasting is evident in the ice rich soils of the Bonnet Plume Basin near the confluence of the Peel River. The area also has an active fire history which affects ground stability, vegetation succession and wildlife distribution.

Outstanding and even rare examples of a number of different landscape features are found in the Bonnet Plume River system. These include the previously mentioned unusually large landslide site just north of Bonnet Plume Lake, as well as evidence of mass wasting and alpine glaciation, complex regional geology, and river morphology. The natural beauty of the main valley and many of the upper reaches of the tributary areas are specifically noteworthy. The mountain peaks, ridges, canyons, incised valleys and small lake settings such as Bonnet Plume, Margaret, and the Quartet Lakes create an attractive and visually appealing wilderness landscape.

Portions of the watershed remained unglaciated during the last ice age as part of the Beringia refugium. Because much of the rest of the Yukon was glaciated during that time, the areas not affected by glaciation contain different landform and vegetation characteristics.

Massive slide below Bonnet Plume Lake (B. Downie)

The Bonnet Plume River system appears to be significant for its biological abundance and diversity, and for rare and unique concentrations of plants and animals. Noteworthy is the presence of the large, sedentary, Bonnet Plume woodland caribou herd, and the concentrations of grizzly bear. Four rare vascular plants, *Papaver walpolei* (Argus and Pryer 1990), *Erigeron hyssopifolius*, *Cypripedium calceolus* ssp. *parviflorum* and *Potentilla pensylvanica* (considered rare north of 64°(N) (Douglas et al, 1981) have been identified in the watershed to date (Kennedy Pers. comm.). Range extending occurrences have also been noted. These include a species of saxifrage, *Boykinia richardsonii*, near its eastern limit, *Oxytropis campestris* ssp. *jordalii* near its southern limit and *Carex filifolia*, *Senecio scheldonensis*, *Goodyera repens* and *Actaea rubra* all at the northern limit of their range. As more detailed vegetation studies are completed, especially in the un-glaciated portions of the watershed, more range extensions and rare plant occurrences are expected to be discovered.

There are also a number of lakes, in the portion of the watershed which remained unglaciated as part of the Beringia refugium, which contain unique, relict fish populations. An example of this is a lake whitefish stock now confined to Margaret Lake.

Natural Heritage Guideline:
The river contains along its course unique, rare or outstanding examples of natural phenomena, formations or features, or areas of exceptional natural beauty.
–CHRS Nomination Guidelines

1.3.3.2 Cultural Heritage Values

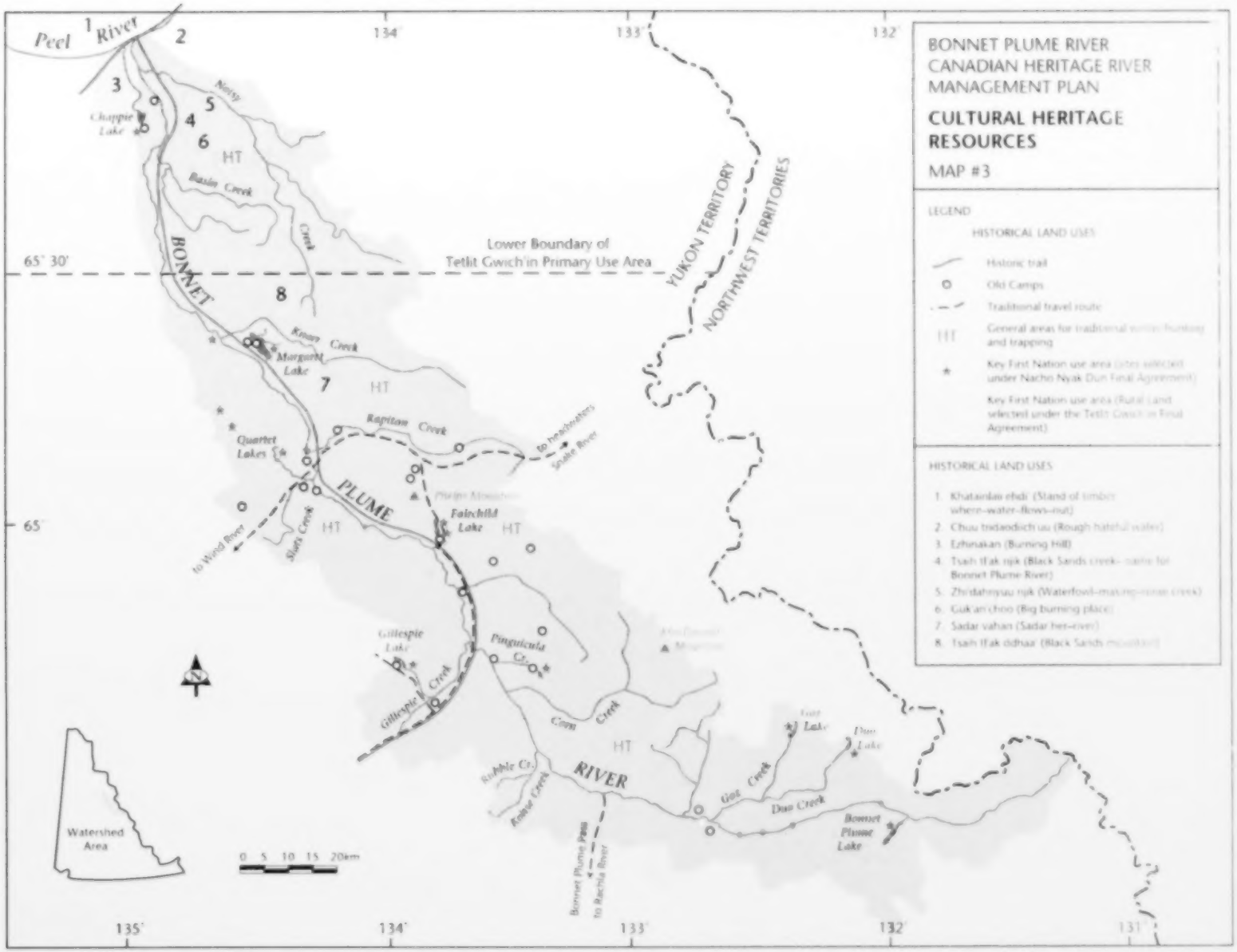
The cultural heritage values of the Bonnet Plume area are an integral part of the rationale behind the nomination of the Bonnet Plume River to the Canadian Heritage Rivers System. The Bonnet Plume watershed has been described by Nacho Nyak Dun and Tetlit Gwich'in elders as part of their inheritance; akin to a priceless, cultural and economic bank **(Map 3)**.

The CHRS selection guidelines for human heritage values reflect a non-First Nations perspective of history and human occupation. Values recognised by First Nations are not necessarily coincident with these categories. For example, 'First Nations people' is listed with 'settlement patterns' and 'transportation'. In reality, the category of First Nations people, introduces a much broader range of potential themes and encompasses First Nations settlement and transportation. In addition, the criteria which emphasise 'persons', 'events' and 'achievements' as well as 'historical or archaeological structures' reflect a more typical Euro-american approach to history.

Natural Heritage Guideline:
The river contains along its course, habitats of rare or endangered species of plants and animals. This would also include areas where outstanding concentrations of plants and animals of Canadian interest and significance are found.
–CHRS Nomination Guidelines

Massive slump near the confluence of the Peel River (B. Slater)

Each of the four CHRS guidelines pertaining to natural heritage are met by the Bonnet Plume watershed.


BONNET PLUME RIVER
CANADIAN HERITAGE RIVER
MANAGEMENT PLAN
CULTURAL HERITAGE
RESOURCES
MAP #3
LEGEND
HISTORICAL LAND USES
Historic trail
Old Camps
Traditional travel route
HT
General areas for traditional hunting and trapping
Key First Nation use area (sites selected under Nacho Nyak Dun Final Agreement)
Key First Nation use area (Rural Land selected under the Tetlit Gwich'in Final Agreement)
HISTORICAL LAND USES
1. Khatsenlaw ehdi' (Stand of timber where-water-flows-out)
2. Chuu tridaodlich'uu (Rough hateful water)
3. Ezhinakan (Burning Hill)
4. Tsah tl'ak njik (Black Sands creek- name for Bonnet Plume River)
5. Zhi'dahnyuu njik (Waterfowl-mucking-nose creek)
6. Gukan choo (Big burning place)
7. Sadar vahan (Sadar her-river)
8. Tsah tl'ak ddhaa' (Black Sands mountain)
Peel River
Lower Boundary of Tetlit Gwich'in Primary Use Area
YUKON TERRITORY
NORTHWEST TERRITORIES
BONNET
PLUME
RIVER
Chappie Lake
Basin Creek
Margaret Lake
Quartet Lakes
Raptor Creek
to headwaters Snake River
Fairchild Lake
Slate Creek
to Wind River
Gillespie Lake
Gillespie Creek
Pinguicula Cr.
Corn Creek
Rabbit Cr.
Rabbit Creek
Bonnet Plume Pass to Rabbit River
Goz Creek
Duo Creek
Duo Lake
Bonnet Plume Lake
Watershed Area
0 5 10 15 20km
65° 30'
65°
134°
133°
132°
135°
131°

The human heritage resource values are deeply rooted in the Tetlit Gwich'in and Nacho Nyak Dun people. The watershed functioned as their larder, travel and trade corridor and seasonal home. The ancestors of the Tetlit Gwich'in and Nacho Nyak Dun followed subsistence lifestyles in the Bonnet Plume area for centuries. The migratory movement of caribou across the upper Peel River basin made the Bonnet Plume drainage an important winter hunting area. The region was also used for travel, meetings, and inter-tribal trade. Other First Nation cultural groups, "Klondikers", trappers and prospectors have also traversed and occupied portions of the valley. Prospectors such as Count V.E. de Sainville explored the region in 1893 followed by government geologist Charles Camsell in 1906.

Today the area continues to draw together the people of Mayo, Yukon, and Fort McPherson, NWT who share a common historical bond. Their special places include traditional subsistence areas, camps, grave sites, and sites of spiritual renewal. All are important features of the area.

Because of the scarcity of documented information, only one of the four CHRS human heritage selection guidelines, the one relating to 'Canadian historical development in terms of first nations people, settlement patterns, and transportation', can be met without further study[5].

The other three criteria relating to persons, events, movements, achievements, ideas or beliefs, unique historical/archaeological structures, and outstanding or concentrated historical/archaeological structures, are only partially met in light of presently available information. The Gwich'in Social and Cultural Institute formed in 1992 recently completed a traditional use and knowledge study of the Arctic Red River as part of that Heritage River Management Plan. Similar work is anticipated involving the rest of the Peel River watershed within Tetlit Gwich'in traditional territory and this will encompass a portion of the lower Bonnet Plume watershed.

On January 30, 1996, the Yukon government signed a Statement of Commitment binding it to the Canadian Biodiversity Strategy and to the protection and maintenance of biodiversity. This belief in the importance of preserving biodiversity and recognising the intrinsic value of wild places is an integral part of the rationale behind seeking CHRS designation for the entire Bonnet Plume watershed. The idea that wilderness has value in its own right and the belief in the importance of biodiversity reflect this national conservation perspective. The Nacho Nyak Dun and Tetlit Gwich'in First Nations hold similar views. They describe it in different terms such as "inheritance value" or respect for "the land". From both of these perspectives, it can be argued that the Bonnet Plume watershed has inherent wilderness value consistent with the Human Heritage Guidelines provision concerning "ideas and beliefs".

1.3.3.3 Recreation Heritage Values

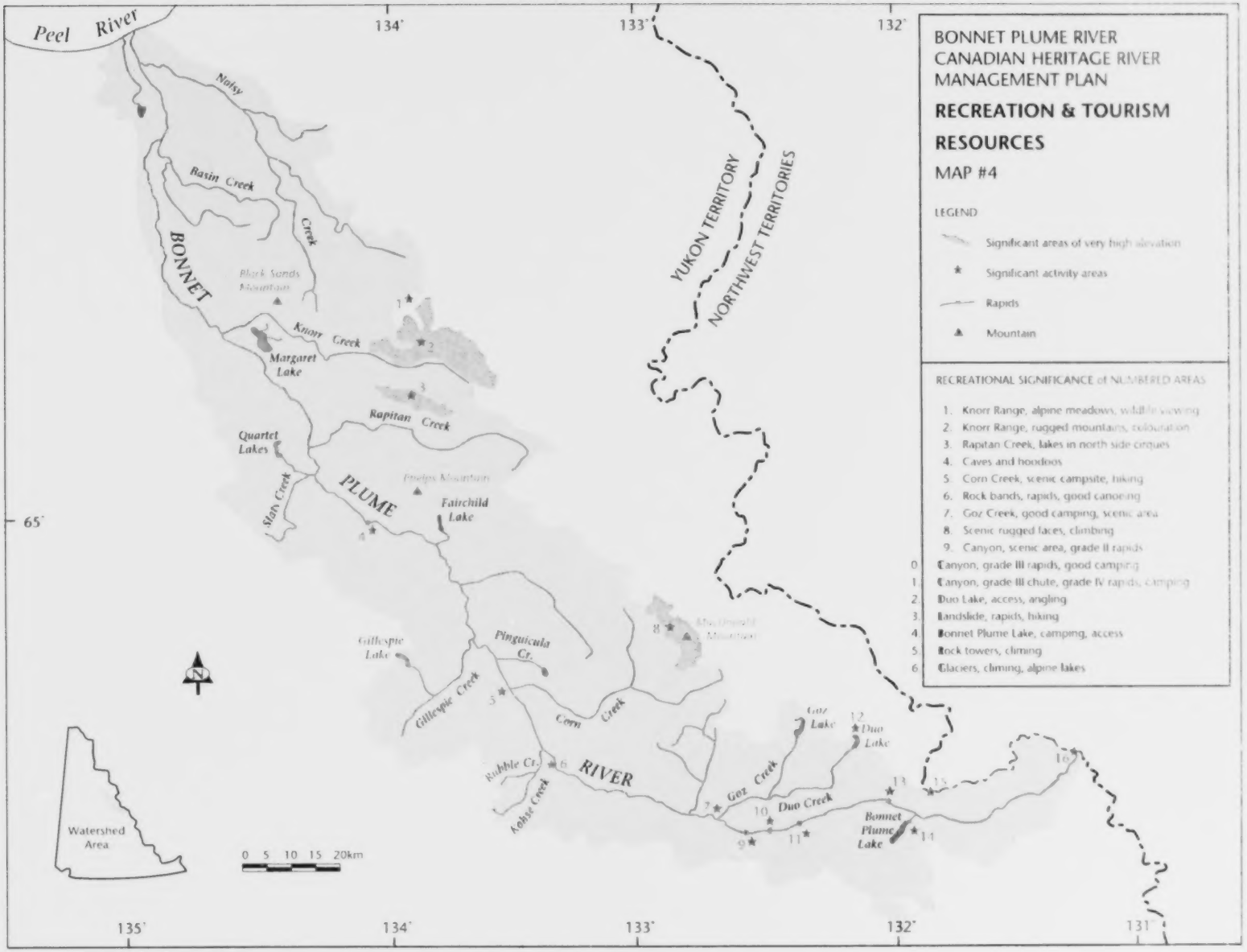
The recreational values of the Bonnet Plume River watershed are exceptional. A wide variety of river oriented and upland recreational opportunities exist, including: kayaking, canoeing, camping, hiking, mountain climbing, hunting and fishing as well as nature study, wildlife viewing, photography, and human heritage appreciation (**Map 4**). Natural values include the diversity and quality of scenic views, and the character of the river itself such as the flow, navigability, quantity and quality of rapids, accessibility and shoreline conditions. A key attribute of the area is its remoteness which limits the number of recreational users. The quality of wilderness experience afforded by the Bonnet Plume area attracts an international clientele.

Campsites along the river are plentiful. In the middle and upper reaches of the river, access to the highlands above the river valley is often easy and inviting. Hiking routes within the watershed can vary from an evening exploration up a small side creek, to major trips into the upper reaches of the drainage basin.

Cultural Heritage Guidelines: The CHRS guidelines indicate that outstanding human heritage value will be recognised when a river environment:

- *has influenced, over a period of time, the historical development of Canada through a major impact upon the region in which it is located or beyond; (this would include its role in such significant historical themes as first nations people, settlement patterns and transportation);*
- *is strongly associated with persons, events, movements, achievements, ideas or beliefs of Canadian significance;*
- *contains historical or archaeological structures, works or sites which are unique, rare or of great antiquity; and/or*
- *contains outstanding examples or concentrations of historical or archaeological structures, works or sites which are representative of major themes in Canadian History.*

[5] Bonnet Plume River: CHRS Nomination Document p. 8


Peel River
134°
133°
132°
Noisy
Basin Creek
Creek
BONNET
Black Sands Mountain
Knorr Creek
Margaret Lake
Rapitan Creek
Quartet Lakes
Slats Creek
PLUME
Phelps Mountain
Fairchild Lake
65°
YUKON TERRITORY
NORTHWEST TERRITORIES
Gillespie Lake
Gillespie Creek
Pinguicula Cr.
Corn Creek
Rabbit Cr.
Kohse Creek
RIVER
Goz Creek
Goz Lake
Duo Lake
Duo Creek
Bonnet Plume Lake
Watershed Area
0 5 10 15 20km
135°
134°
133°
132°
131°
BONNET PLUME RIVER
CANADIAN HERITAGE RIVER
MANAGEMENT PLAN
RECREATION & TOURISM
RESOURCES
MAP #4
LEGEND
Significant areas of very high elevation
Significant activity areas
Rapids
Mountain
RECREATIONAL SIGNIFICANCE of NUMBERED AREAS
1. Knorr Range, alpine meadows, wildlife viewing
2. Knorr Range, rugged mountains, colouration
3. Rapitan Creek, lakes in north side cirques
4. Caves and hoodoos
5. Corn Creek, scenic campsite, hiking
6. Rock bands, rapids, good canoeing
7. Goz Creek, good camping, scenic area
8. Scenic rugged faces, climbing
9. Canyon, scenic area, grade II rapids
10. Canyon, grade III rapids, good camping
11. Canyon, grade III chute, grade IV rapids, camping
12. Duo Lake, access, angling
13. Landslide, rapids, hiking
14. Bonnet Plume Lake, camping, access
15. Rock towers, climing
16. Glaciers, climing, alpine lakes

The concentration of wildlife provides visitors with exceptional wildlife viewing opportunities. Sheep, caribou, bear and moose are common sights and add much to the wilderness experience. Similarly, special natural features such as Landslide Canyon and sites of cultural importance provide rewarding opportunities for visitors to appreciate the character of the Bonnet Plume area.

The level of anticipated visitation for the foreseeable future and the nature of recreational activities likely to occur will have minimal impacts on the natural, historical or aesthetic values of the Bonnet Plume watershed. The vast majority of the river corridor is quite capable of providing a high quality recreation experience, while at the same time retaining the natural and cultural values of the area. The Bonnet Plume is a large river basin with widespread opportunities for recreational activity.

One of the key reasons for nominating the Bonnet Plume River to the CHRS is the quality of the wilderness recreation experience it affords the user. Because the quality of the wilderness recreation experience is dependent on the user's perception of what wilderness is, there are inevitable conflicts in interpretation.

The essence of wilderness is reflected in such experiential qualities as landscape visual integrity, personal solitude, biodiversity and naturalness, and the absence of evidence of prior human use.

It is worth noting here that providing special status (especially protective status) will generate more interest in the river. Based on experience elsewhere, the numbers of commercial river operators and recreation users can be predicted to increase. This first management plan anticipates and responds to these concerns.

Recreation Value Guidelines:

The river:

- *possesses an appropriate combination of recreational opportunities and related natural values which together provide for an outstanding recreational experience; and*
- *is capable of supporting recreation uses without significant loss of, or impact, on its natural, historical or aesthetic values.*

–CHRS Nomination Guidelines

Canoeing upper portion of river above Goz Creek Rapids (B. Downie)

General Integrity Guidelines:

The river should:

- *be of sufficient size and contain all or most of the key inter-related and inter-dependent elements to demonstrate the key aspects of the processes, features, activities or other phenomena which give the river its outstanding value;*
- *contain those ecosystem components required for the continuity of the species, features or objects to be protected; and*
- *provide a quality of water such as to provide for the continuity and/or improvement of the resource upon which 'value' to the system has been determined.*

1.3.3.4 General Integrity Guidelines

In addition to specific natural, cultural and recreational value guidelines outlined above, a river and its immediate environment must meet general integrity guidelines for designation to the CHRS.

The Bonnet Plume watershed has been nominated in its entirety and constitutes a substantial area, extending almost 350 km from its headwaters along the Yukon/NWT border to its confluence with the Peel River. The designated area covers approximately 12,000 sq. km, or about 2.5% of the Yukon Territory. Designation of the entire Bonnet Plume watershed fully satisfies the integrity criteria by capturing the inter-related and inter-dependent elements of the watershed. This meets the objectives of both First Nations who seek to influence land and water management within the entire watershed. It also meets the habitat needs of key wildlife species such as caribou and grizzly bear. It is also a logical planning unit that can be defended on the basis of the intent of CHRS designation and the priority attached to protection of water in the land claim settlement legislation. The watershed is largely intact wilderness with limited evidence of human activity beyond traditional use, outfitting and some mineral exploration. Current land uses within the Bonnet Plume watershed include; mining exploration, First Nation subsistence use, river rafting and canoeing, hiking and big game outfitting.

Mining exploration in the watershed has continued in spurts over a number of years since the forties. The currently active claims are concentrated between Fairchild Lake and Rapitan Creek on both sides of the main stem of the river, in the heart of the watershed.

The conservation community perceives these claims and their potential to become active mines, as the single greatest threat to the long term integrity of the watershed's wilderness. They believe any development could compromise CHRS designation. The mining community disagrees. Evidence to date suggests that while past exploration activity had often been undertaken in an arbitrary and insensitive manner, this is not currently the case.

The First Nations' people have a long history of use, and have selected a number of specific sites and special areas throughout the valley as part of their land claim settlements. The Nacho Nyak Dun for example, have 14 site-specific land selections in the watershed, while the Tetlit Gwich'in have one.More research on First Nation traditional use and occupancy was already acknowledged as an area of concern in the background study and CHRS nomination report. It was also suggested that improving this knowledge base should be a management plan priority.

The preservation of human heritage values has largely been ensured by the remoteness of the river valley. Its wilderness qualities provide essentially the same human heritage setting that would have existed in centuries past. It is difficult to predict the specific potential impacts at this time from a development and use perspective. It is also difficult to forecast either the number of potential future recreational users, or the likelihood that mining will become economically viable in the Bonnet Plume valley. In both cases, this uncertainty makes predictions challenging when it comes to identifying the associated ecological impacts on watershed integrity.

From a management planning perspective, it is feasible to anticipate, in general terms, the types of issues which this range of land and water use activities might generate. Thus it is possible to identify the information deficiencies, assess their significance and set research priorities. Any debate over land use priorities can then be made on a rational basis regardless of vested interest.

In dealing with these issues in the management plan, it is important to realise that the respective land claim settlement legislation takes precedence. The Bonnet Plume River does meet the nomination criteria for the CHRS program. Since inclusion in the CHRS carries with it certain conservation responsibilities, the management plan must find a way to express the expected "higher duty of care" in tangible terms that all land and water users can understand and support. The work program in **section 4** responds to this challenge.

Neighbouring land uses do not currently impact on the use of the Bonnet Plume River valley. The area remains a remote and relatively undisturbed natural environment. However, the watershed and its sister rivers, the Snake and Wind, are all tributaries of the Larger Peel River drainage. Thus management decisions involving any one or all of the three rivers, have potential spill-over implications for the other watersheds. For example, access routes in or out of the Bonnet Plume watershed cross one river or the other. All major mammal populations also move, to some degree, between the three drainages.

Water quality in the Bonnet Plume River remains in its natural state. No dams or water impoundments have been created in the watershed. Under the Arctic Environmental Strategy program all known former exploration sites, abandoned fuel caches and other evidence of previous activity have been identified and/or cleaned up.

The decision to nominate the entire watershed rather than the main stem of the river alone is based on a recognition that the issues that might compromise the general integrity guidelines are regional in scope. The watershed is a natural ecological unit. It is large enough to sustain the wilderness values for which the river has been nominated and ensure management intervention if needed, is effective in protecting the diverse values present. Protection of water quality and grizzly bear habitat, for example, require a watershed approach to be effective.

Exploration has increased substantially between 1993 and 1996 with over 30 kilometres of the main stem of the river currently staked. Significant mineralisation has been identified in this core area by a variety of companies.

Confluence of Bonnet Plume and Peel Rivers (B. Slater)

"We remain resolute that the most responsible way to undertake planning in the Bonnet Plume watershed would be to complete a land use and conservation strategy for the Peel River watershed. The Bonnet Plume watershed would then be one component of a much larger area. Only in this way can we be assured that key wildlife habitat, wildlife, fish populations, and representative wilderness will be protected. The land use approach in the Bonnet Plume watershed must be considered in the context of overall conservation objectives. Pre-emptive land use decisions in the watershed could affect the ecological integrity of the entire Peel River watershed. (Conservation Organisation)

1.4 Management Plan Challenge

1.4.1 Stakeholder Expectations and Competing Interests

The CHRS Management Plan is expected to provide a framework for co-operative management within the limitations of existing legislation and policy. The Nacho Nyak Dun and Tetlit Gwich'in land claim agreements create specific constitutional obligations for government which may have a bearing on future land and water management within the Bonnet Plume watershed.

This includes the formation of a number of bodies such as the Mayo District Renewable Resources Council and the Peel River Watershed Advisory Committee (with a two-year life-expectancy). The legislation also provides an opportunity for the future establishment of a Regional Land Use Planning Commission and a Development Assessment Process. As part of the tripartite partnership with government, the MDRRC role is to provide a local forum for discussing management plan content. This plan recommends the MDRRC also help co-ordinate subsequent implementation and monitor work program results.

CHRS designation provides a means for First Nations to influence decision making involving both settlement and non-settlement lands. The selection of a watershed boundary was intentional and reflects both First Nation's desire to take a holistic and ecological perspective to land and water management. The Bonnet Plume represents a rare opportunity to manage a watershed in its entirety and guide development and use accordingly. However, the scope of the CHRS designation limits its effectiveness as a conservation tool because it relies on co-operation and consensus among stakeholders rather than outright regulation. As such, the management plan provides a focus for discussion of resource management issues on a watershed basis. It includes partnership research priorities, work programs and guidelines for implementation. While it is not a land use plan, it can contribute to subsequent regional plan development by identifying areas which merit a higher level of protection using other legislative means.

To identify the limits of this initial CHRS Management Plan and the opportunities for co-operation, stakeholder expectations and competing interests need to be understood. The final arbitrator remains the government with regulatory authority for the matter at issue. All agree with the recommendation that the MDRRC should be the focal point for discussion at the local level. The broader public expects elected representatives at all levels of government to make final land use decisions in an open and transparent public process (Peepre Pers. comm.).

The Advisory Committee could not reach consensus on a number of issues. The most notable difference is the split between the conservation and mining communities. The conservation community wants a regional land use plan prepared first, with conservation and wilderness protection given priority. They argue cumulative impacts need to be considered at all stages of exploration and development assessment. Until a regional land use plan is completed, they say, further exploration and development should stop because it compromises the area's wilderness values.

The mining community disagrees with this position. They want their legal property rights (established through their staked claims) recognised at the outset. They seek regulatory certainty with voluntary compliance to the management plan's objectives. They also want an unbiased regional planning process which supports a multiple use focus.

The dilemma is that while each side acknowledges the value of a regional land use plan, each wants to predetermine the plan outcome.

The Management Plan Steering Committee acknowledges that these different perspectives exist. Some areas of consensus have been identified and are being used as a foundation for building the management plan. These include:

- a common preference to use the MDRRC as the focus for local discussion of management plan content;
- agreement that the baseline information needed is incomplete and collection of such information should contribute to the eventual preparation of a regional land use plan;
- recognition that the constitutional obligations under First Nations land claims legislation take precedence and that CHRS designation establishes a "higher duty of care";

- agreement that the plan should provide a framework for co-operative management with roles and responsibilities clearly defined;
- recognition that the "higher duty of care" may translate through the regional planning or development assessment processes into a requirement for some special management areas within the watershed, off-limits to exploration and development on a temporal or spatial basis;
- agreement that the plan should include measurable performance standards so the management plan's function and relationship to the development assessment process (DAP) is clearly spelled out; and
- agreement that the performance measures used should reflect the issues involved and ensure the objectives for which the river was nominated to the CHRS are met.

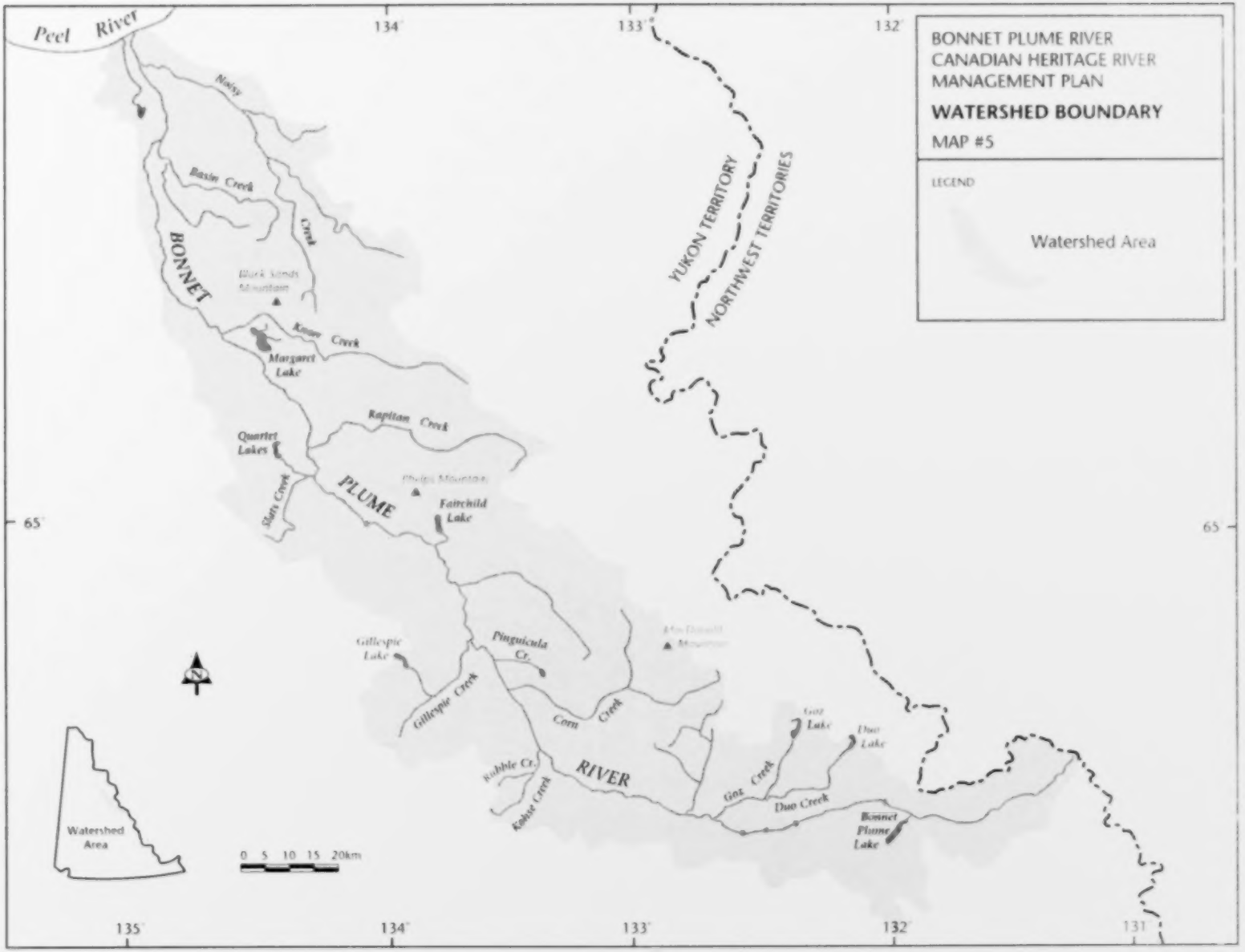
The respective positions of the major stakeholder interests in the Bonnet Plume watershed are listed in **Table 1**. The table also summarises their management plan expectations based on the comments documented in the Advisory Committee workshop meetings and correspondence received on the first draft of the management plan.

"Where the parties differ is that the conservation interests are interested in extending the scope and jurisdiction of the CHRS designation and management plan beyond what is possible under the CHRS program; mining companies wish to preserve the intent of the CHRS program that provides for a co-operative approach to multiple uses of the lands and resources within the Bonnet Plume River basin while conserving the values for which the river was nominated." (Mining Company)

TABLE 1–Stakeholder Management Plan Positions

Stakeholder Interest	CHRS Management Plan Expectation
Nacho Nyak Dun/ Tetlit Gwich'in First Nations	• implementation of land claim agreement obligations • central role in all land and water use decision making • recognition of "inheritance" value implies a higher duty of care • MDRRC forum for local involvement in CHRS Plan preparation, implementation co-ordination and decision making • contribute to regional land use plan • CHRS designation mechanism for degree of local control and influence
Government Interest	• regulatory authority • implementation of land claim agreement obligations • clarify respective roles and responsibilities in future management • comply with CHRS nomination requirements • work program which provides a framework for management for issues identified, research priorities set and partner responsibilities defined • inclusion of sufficient detail and guidance to facilitate development assessment in a timely manner, contribute to regional planning, and preserve and protect wilderness values • support role of MDRRC as forum for discussion and debate • recognise information gaps, budget & resource limitations • protect the heritage resources of the river while working within existing regulation and policy
Guide /Outfitter Interest	• support in principle CHRS designation and protection measures which ensure sustainable wildlife popul ations
Conservation Community Interest	• respect land claim agreement obligations • moratorium on development in entire Peel River watershed until a land use and conservation strategy is in place • conservation objectives must have priority; river nominated for its biodiversity and wilderness recreation values so management plan must have a conservation focus; define protected areas • present land use regulations and policy inadequate to protect wilderness values; mines and roads are incompatible land uses • significant gaps in baseline information concerning wildlife ecology, First Nations cultural use, wilderness values • quality of management plan will set precedent for similar plans; need performance standards and zoning
Mining Community Interest	• respect land claim agreement obligations • Plan should acknowledge area's high mineral potential, presence of significant active exploration and industry's existing property rights • process of how commercial resource use and associated activities will be managed as well as what standards will be applied must be clear • complete baseline mineral studies before making land use decisions • present land use regulations, development assessments and permitting procedures for environmental protection must be maintained • placer mining should be encouraged in the watershed • recognise industry already applying "higher duty of care" on a voluntary basis and working with MDRRC • not opposed to regional planning; watershed can support multiple use

Source: Correspondence First Draft Management Plan Responses 1995


BONNET PLUME RIVER
CANADIAN HERITAGE RIVER
MANAGEMENT PLAN
WATERSHED BOUNDARY
MAP #5
LEGEND
Watershed Area
Peel River
Noisy
Basin Creek
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Goz Creek
Duo Creek
Bonnet Plume Lake
Watershed Area
0 5 10 15 20km
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1.4.2 Higher Duty of Care

Adoption of this management plan does not imply business as usual. Although the legislative ground rules have not changed there are certain implied commitments that flow from the plan which affect development proponent initiatives and decision making reviews. For example, there is an implied "attitude" shift towards advance consultation, shared research and the consideration of the watershed as a whole ecosystem with a variety of resource values. Heritage River status also implies a desire by all parties to ensure the land use planning and development assessment processes properly "value" the natural attributes for which the river has been nominated.

The "higher duty of care" is reflected in the management plan's philosophy which promotes an ecosystem approach to resource management as well as adopting a watershed focus for land use planning and development assessment. It is also reflected in the references to First Nation's inheritance values and the obligations set out in the respective land claim agreements. Finally, the management planning principles and implementation strategy relies on all stakeholders to adopt the spirit of co-operative management and reflect it in their actions.

The Bonnet Plume Heritage River Management Plan is based on an ecosystem approach to resource management which integrates all known resource values.

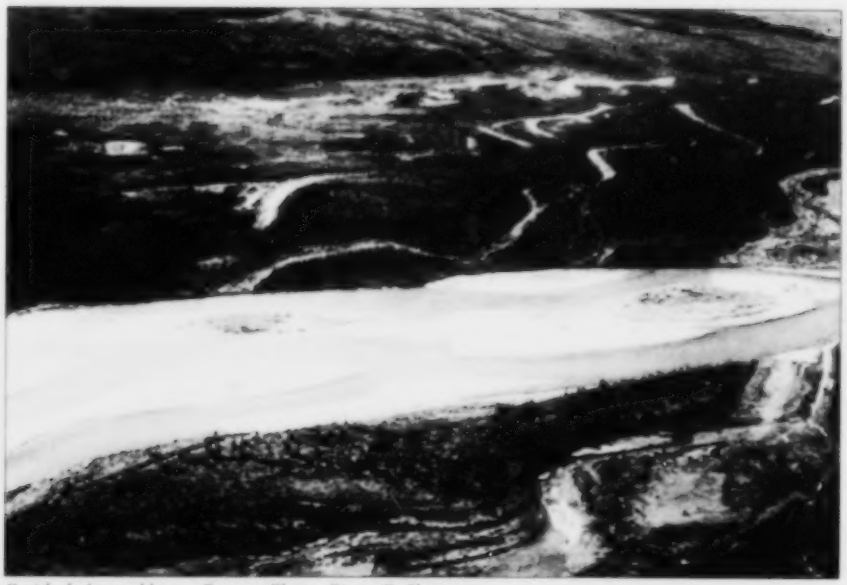
1.4.3 Watershed Focus

There are philosophical, technical and management reasons for including the entire watershed in the CHRS nomination. From a First Nation's perspective the analogy of protecting the "family farm" and its legacy value best illustrate the philosophical intent. In spiritual and practical terms the watershed boundary reflects a strong relationship to the land as a whole. To protect the river's heritage values from the First Nation's perspective, a watershed boundary is politically expedient because it provides the ability to influence decision making on both settlement and non-settlement lands.

From a technical, water management planning and administration perspective, a watershed boundary makes most sense. The watershed boundary (**Map 5**) facilitates management planning because it is a natural ecological unit. Many of the Bonnet Plume watershed's stated heritage values are also dependent on an appreciation of the "big" picture. This boundary responds to the needs of large mammal species such as grizzly bear, moose and caribou; along with the protection of biodiversity, water quality and wilderness. It makes sense when the opportunity is there to use a natural rather than artificial political boundary for management planning. This also reflects the nature of the issues which are likely to arise.

1.4.4 Ecosystem Approach To Resource Management

The concept of heritage river designation and the use of a watershed boundary are based on an ecosystem principle of integrated resource management. This approach works when there is agreement to establish "co-operative partnerships" to achieve agreed upon heritage protection objectives. In the case of the heritage rivers program, voluntary compliance is the cornerstone for program success. Goodwill and co-operative action in the Bonnet Plume watershed can work effectively if an integrated resource management approach is adopted.



Braided channel lower Bonnet Plume River (B. Slater)

The Management Plan should foster actions which:

- *complement existing regional planning processes and management arrangements envisioned under the Land Claim Settlement agreements ;*
- *promote voluntary partnerships to fill information gaps, conduct research, share information, monitor land and water activity and encourage the higher duty of care envisioned by CHRS status;*
- *embody long-term commitments to the identification, protection, interpretation and sustainable use of the river's nationally recognised heritage;*
- *encourage local participation in decision making;*
- *respect the differences between various land and water use activities and the legal rights of the users under present legislation; and*
- *contribute to other established processes and mechanisms for decision making (e.g. Water Board, Development Assessment Processes).*

2.0 HERITAGE RIVER MANAGEMENT PLAN

2.1 Management Plan Goal

The goal of the Bonnet Plume River Management Plan is:

> "To establish a co-operative management framework that advocates watershed \an heritage values for which the river has been nominated are sustained."

2.2 Management Area Boundary

The management plan includes the entire Bonnet Plume drainage basin (approximately 12,000 sq. km) from its headwaters in the Mackenzie Mountains to the confluence of the Peel River, approximately 350 km distant **(Map 5)**. It is one of several remote and wild rivers which make up the principal tributaries of the larger Peel River drainage. The watershed boundary makes sense from a river management perspective. It encourages a holistic, integrated resource management approach.

2.3 Management Planning Principles

The management plan does not impose any new legislation or regulations. It is intended to guide conduct and advocate voluntary actions that promote shared objectives. At this time, because of knowledge limitations, it must function more as a road map identifying information needs and research priorities . These in turn will contribute to and facilitate land and resource use decisions within the context of the Heritage River nomination.

2.3.1 Conflicting Management Plan Perspectives

The public consultations and Advisory Committee discussions confirm there are significant differences in perspectives and expectations for the management plan. These expectations need to be clarified. The CHRS program relies on inter-agency and stakeholder co-operation using the existing legislative framework to achieve its objectives. Thus it is essential that common ground between competing interests be identified.

The management plan does focus on meeting the management requirements necessary to implement CHRS nomination obligations. It focuses on filling the information gaps necessary to improve decision making. It recognises that data collection priorities can contribute to the preparation of a regional land use plan and to the identification of potential mitigative measures, but it has no mandate to be a land use plan.

Wilderness has value in its own right from a holistic, biodiversity and ecological perspective. It is also a finite resource that is easily compromised by competing uses and thus has limited carrying capacity. Carrying capacity can be defined as the ability to withstand use and change without impairment of the natural attributes present. For example, if solitude and naturalness are wilderness attributes, the visible presence of others or their activities may be perceived as impairing wilderness values.

The management plan focuses on identifying those wilderness values present in the Bonnet Plume watershed and the types of inter-related influences and experiential impacts which would compromise the heritage values for which the river was nominated.

Industry recognises the management plan focus is to meet the obligations associated with nomination to, and inclusion in the CHRS. However, the Bonnet Plume watershed has high mineral potential and a number of significant mineral deposits have been identified. Over 30 kilometres of the main stem of the river have already been staked with obvious implications for wilderness recreation and preservation of heritage river values. The industry does not want the area to be off-limits to exploration in the future. Under present legislation, Heritage River status does not change the ground rules, and mineral exploration can continue.

The higher duty of care and influence over subsequent decision making envisioned by First

Nations and governments in agreeing to Heritage River status as the mechanism for protecting the Bonnet Plume River does not preclude consideration of other forms of development and use within the watershed. This management plan will contribute information which will assist First Nations and government to determine whether the benefits and impacts associated with other uses compromise the river's heritage values or unreasonably restrict other opportunities for social and economic development.

The management plan can identify the potential for cumulative impacts[6], knowledge deficiencies and other matters which might be considered relevant during normal regulatory review. Clarity and timeliness of the review process, regulatory accountability and the relationship of CHRS status to the regulatory review process need to be clarified to avoid duplication of effort.

"The management plan should focus solely on the protection of the heritage values for which the river has been nominated; conservation and wilderness protection should have priority". (Environmental Protection and Conservation Interests' position)

2.3.2 Spirit of Co-operative Management

The management plan relies on voluntary co-operation to make it work. For that reason, given the philosophical differences of opinion between stakeholders, the Plan focuses on areas of common ground and certain principles for co-operation. Stakeholders agree that:

- there are significant baseline information gaps that need to be filled for resource management, regional planning and development impact assessment purposes;
- the effective use of limited, stakeholder resources requires a framework for co-operation which includes an identification of research priorities, participant roles and responsibilities, costs and implementation timelines;
- the tripartite Steering Committee provides the working level structure to oversee plan implementation, co-ordinate work program activity, and exchange information;
- actions should be result-oriented and measurable, with individuals and agencies collectively responsible for actions taken;
- the research and planning process will be holistic, encouraging an integrated resource management approach that respects the inherent values of wilderness preservation, and acknowledges the potential for resource extraction, recreation and other uses that are possible in the Bonnet Plume watershed; and
- the management plan will evolve and mature at a pace and scale of action consistent with stakeholder willingness to work together to contribute to plan implementation.

"The management plan should accommodate all land uses. It must recognise our legitimate exploration and mining rights". (Mineral Industry position)

2.4 Resource Management Objectives

The resource management objectives described below form the basis of the action steps described in the work programs. The work programs are found in **section 4.4**.

2.4.1 Natural Heritage

Main Objective

To maintain the integrity of the watershed ecosystem by:

- completing an ecosystem classification study of the watershed relating vegetation communities, landform features and geomorphology to wildlife habitat, seasonal wildlife use and movement, and resource value;
- identifying the presence and habitat requirements of rare, threatened or endangered species within the watershed;
- preparing baseline inventories of water quality, quantity and flow; fish and wildlife habitat, species productivity and relating harvest yields to resource productivity;
- completing assessments of the location, quantity and quality of the renewable and

[6] Cumulative impacts, both positive and negative are to be considered under the new CEAA legislation, yet the scope is not defined. For clarity in this plan, cumulative impacts refer to the multiple effects induced by a given action whether intended or not. This plan requires a proponent to identify and trace the path of potential individual actions to see if the consequences of each action, when taken together, are likely to compound a given impact or result in some other outcome. For example, anyone wishing to build a road in the Bonnet Plume watershed would have to consider not only the immediate and obvious impact of removing vegetation and laying gravel, but also indirectly, whether the location and route alignment will cause such problems as erosion, wildlife habitat loss or compromise other wilderness values.

non-renewable resource potential within the watershed including the identification of respective impacts;

- the preparation of comparative analyses of mineral resource potential with natural conservation values to determine the implications of each for heritage river management;
- identifying areas within the watershed which merit special protection and conservation measures to ensure the ecological integrity of the watershed and the heritage values for which CHRS nomination was sought;
- developing monitoring methods and recommending standards of performance that define the limits of acceptable change which reflect the values for which the Bonnet Plume River watershed was nominated;
- minimising the visual impact of development activities and presence of human activity on the landscape; and
- preparing an appropriate range of interpretative materials to raise awareness of the natural history of the Bonnet Plume watershed and an appreciation of the natural heritage values for which it has been nominated.

2.4.2 Cultural Heritage

Main Objective

To identify and protect cultural heritage resources within the watershed by:

- initiating under the direction of the Nacho Nyak Dun and Tetlit Gwich'in First Nations, a systematic inventory of current and traditional land use within the watershed which will record, preserve and interpret the history of the area (including the oral history), from both First Nations' and non-First Nations' perspectives, for the benefit of future generations;
- providing land use agencies with a list of culturally significant sites in the watershed so that they can be taken into account before permits and licenses for other uses or activities are issued;
- incorporating traditional knowledge and First Nation participation in all applicable aspects of watershed management including the identification of research priorities and methods, planning, monitoring and impact assessment;
- applying generally accepted heritage resource conservation techniques and standards to protect the integrity and interpretative value of cultural heritage artifacts; and
- encouraging First Nations to continue traditional use activities within the Bonnet Plume watershed.

Typical tributary creek, upper Bonnet Plume (B. Slater)

2.4.3 Recreation & tourism

Main Objective

To provide visitors with the opportunity to discover a distinctive ecological region of the Yukon and experience a unique river environment in ways consistent with the natural and cultural heritage values for which the river was nominated by:

- conducting an assessment of the recreation and tourism market potential of the watershed;
- determining appropriate carrying capacities and management

strategies for the range of activities contemplated;

- identifying the economic benefits of recreation and tourist use and developing methods to ensure the benefits of such activities are directed to the local communities of Mayo and Ft. McPherson to the greatest extent possible;
- promoting backcountry use and wilderness travel etiquette to minimise conflicts between users, encourage safe travel practices and minimise disturbance to wildlife, historic sites and other land users;
- establishing methods to inform, and educate the public, for example through interpretation of Heritage River features compatible with a wilderness travel experience (e.g. river travel guides);
- consulting the Nacho Nyak Dun and Tetlit Gwich'in First Nations in all aspects of recreation and tourism development to ensure such activities occur at a scale, pace and in a manner which considers their objectives for economic development;
- establishing methods to track visitor use, monitor and assess the social, economic and environmental impacts of each recreational activity to determine the limits of acceptable change; and
- assessing the need to recommend such spatial, temporal or other controls as are necessary to control future commercial use and ensure the sustainability of the wilderness experience offered.

"Genetic variety, species diversity, habitat relationships and movement patterns within the Bonnet Plume watershed need to be documented."–CPAWS

2.5 Management Plan Issues

Management issues which affect CHRS status and implementation of the main objectives are discussed in the following sections. Research priorities and suggested implementation work programs are found in **section 4.4**.

2.5.1 Biodiversity

Situation Analysis

The Bonnet Plume watershed is part of the larger Peel River drainage and is representative of the eastern half of the Mackenzie Mountains ecoregion. Ecoregions reflect regional similarities in landform formation, soils and climatic conditions. The ecological relationships within the Bonnet Plume watershed are not well documented and thus are not clearly understood.

It is a largely undisturbed ecosystem which appears to support significant, healthy populations of grizzly bears, wolves, moose, gyrfalcons and woodland caribou. The area's remoteness is partly responsible for the lack of biological research activity. The catalyst for biological research activity has usually been mineral exploration or wildlife management responsibilities. Thus it has often been site and species specific, as well as reactive rather than holistic and active.

Current baseline information on climate, physiography, hydrology, glaciation and vegetation is quite general (Oswald & Senyk 1977) making it difficult to assess the relationships between ecosystem characteristics using a conservation biology approach.

More detailed data collection is not always practical. For example, in a heritage river management context, protection of water quality and quantity of flow are listed as management priorities. Thus it would be desirable to establish the baseline condition of the river, its relationship to the area's climate, surficial geology, river morphology and vegetation. This sort of detailed study would be an expensive and time consuming proposition. It would further be complicated in the Bonnet Plume watershed by natural phenomena such as ice rich soils which show on-going evidence of massive slumps reaching the main river channel. These slumps divert the channel and impair water quality in the river. Therefore, in the context of the existing wilderness river environment, the merits of such research must be weighed against other information need priorities and potential threats to the river environment.

The Canadian Parks & Wilderness Society (CPAWS) argues that the Bonnet Plume

"A conservative approach to management is the best strategy when there is a lack of data."

(Conservation Biologist)

Management Plan needs to be developed from a conservation biology perspective which takes an ecosystem approach to watershed management to ensure heritage river nomination values are retained. For this approach, the biodiversity of the Bonnet Plume watershed would need to be studied in the context of its relationship to neighbouring rivers, and the Mackenzie Mountain ecoregion as a whole.

From a conservation biology perspective, it is important to identify "unnatural" critical change factors which may potentially upset the inherent stability of the ecosystem that the Bonnet Plume watershed is a part of. In this case, critical change factors would include:

- the loss of wilderness values such as a reduction in the quality, quantity and diversity of plant, animal and fish species along with associated habitat;
- the reduction of the quality of the wilderness to the visitor through the loss of solitude, evidence of over-use, wildlife behaviour changes or the presence of other land and water uses perceived to be incompatible with their activities.

The absence of a systematic, current inventory of ecological conditions makes it difficult to identify the appropriate protection measures for the Bonnet Plume as a Canadian Heritage River at this time. Resolving this deficiency is a management plan priority to ensure the CHRS integrity guidelines are met.

2.5.2 Wilderness

Situation Analysis

The Bonnet Plume watershed is remote and relatively inaccessible, with no all-season road access. There is little persistent evidence of human activity in the watershed. The natural ecosystem in the Bonnet Plume valley appears largely intact and unaffected by past and current land use.

Peoples' perceptions of wilderness vary according to cultural attitudes, beliefs, type of use and behaviour. Some people feel wilderness is land not altered by human use with plant and animal life affected only by natural processes (Hummel 1989). Others accept human use but place temporal, spatial and activity limits on the extent of acceptable alteration.

> "It is important to note that the lines dividing First Nations perspectives and Euro-american ideas on wilderness are now much less clear. There is much common ground on the reasons for protecting wild nature as people have begun to understand differing cultural perspectives. The idea of wilderness as home is widely accepted by many Canadians, particularly those in the north." (Peepre, Pers. comm.)

The *Yukon Environment Act (1991)* defines wilderness as:

> "any area in a largely natural condition in which ecosystem processes are largely unaltered by human activity, or in which human activity, has been limited to development or activities that do not significantly modify the environment, and includes an area restored to a largely natural condition"

Wilderness has intrinsic value because it supports all life forms and natural processes as they are, in their own right within the ecosystem in which they live. To the Nacho Nyak Dun and Tetlit Gwich'in, they perceive themselves as part of the land rather than distinct from it. Thus the Bonnet Plume watershed is part of their "homeland" (Cruikshank Pers. comm.) and they are a natural part of the ecosystem in which they live. Wilderness is not viewed as a separate entity with a spatial label (Popadynec 1990). From a First Nations perspective, traditional and subsistence uses form part of the wilderness character of the Bonnet Plume River.

Others also use the Bonnet Plume watershed to hunt, fish and trap. The watershed contains two big game outfitting concessions and their associated camp infrastructure. There is also a long history of mineral exploration over the past century. One winter tote road constructed in the 1960's is still used for winter access to exploration sites. A number of small airstrips have also been developed to access exploration camps within the watershed. In recent years, the Bonnet Plume has begun to attract other users including rafters, canoeists, hikers and others interested in wildlife viewing. These recreation users reflect different values and perceptions of wilderness that may conflict with other users.

In general, most users of the Bonnet Plume would agree that within the definition used by the *Yukon Environment Act*, the watershed appears to remain in a "wilderness" state largely unaltered by human activity. Disagreement among users arises when discussion focuses on the types of appropriate land use activities which should be permitted in the watershed. Also at issue is the definition of "limits of acceptable change[7]" before wilderness values are permanently impaired.

The difference of opinion over the "limits of acceptable change" correspond to user activities and interest. The recreational user values and expects qualities of naturalness and solitude. Evidence of prior use, contact with other recreational users, changes in wildlife behaviour and the need for "rules" all intrude and diminish the wilderness experience. Other users can tolerate higher levels of land use change and do not mind "sharing" the Bonnet Plume watershed. Their tolerance for multiple use may reflect differences in their value systems.

The dilemma for the Bonnet Plume Management Plan lies in this difference in user perspectives and the associated implications for wilderness conservation. Wilderness is a diminishing resource. Unaltered landscapes where naturalness and ecological processes prevail over human use are rapidly disappearing.

"Wilderness is recognised as a natural resource with intrinsic ecological as well as economic value and shall be considered as such in the establishment and implementation of a resource management plan...and development approvals and assessment"–Yukon Environment Act 1991

[7] "Limits of Acceptable Change (LAC)" refers to a planning and management methodology that recognises all land use causes environmental change. It focuses on managing the impacts of use, by clearly defining the desired ecological and resource condition in measurable objectives. The objectives are then translated into specific management actions that achieve or sustain the desired condition. Managers identify where, and to what extent, varying degrees of land use change are appropriate and/or acceptable without compromising the desired land use condition.
LAC methodology becomes more problematic where change is induced by a natural process such as fire. For example, on the lower Bonnet Plume, the massive slumps which have occurred are a natural process that is aggravated by fire melting the permafrost. A single major slump, similar to those that have occurred to date can significantly alter river morphology for a significant period of time and have just as much or more impact than man-induced land use change. In a wilderness setting, the objective is to minimise or eliminate the need for any direct management intervention by monitoring use.

Rafters on Bonnet Plume River (B. Downie)

In an ecological sense there are also inherent natural limits of acceptable change where human activities negatively affect wildlife habitat, species composition and biological diversity.

The level of acceptable use and subsequent change before these values are perceived to be compromised depends on a variety of factors. These include the level and intensity of use, compatibility of uses present, the extent of area involved and its location, timing of use, mitigation and rehabilitation techniques applied, and impact on watershed character. For example, outfitting generally occupies the more remote reaches of the watershed and extends over the shoulder seasons, avoiding direct conflict with other river recreational activity. Mineral exploration is conducted during the summer at the same time as recreational activity in the valley (i.e. recreational use of the river itself). For some, aircraft flying overhead, the sound of equipment working, encountering other parties or facilities, and evidence of previous users may diminish a true wilderness experience. For others, the presence of an outfitting camp or exploration airstrip facilitates access and is not perceived to diminish the recreational experience.

Three types of land use activity in the Bonnet Plume watershed could potentially degrade wilderness resource values. First, as a nationally recognised heritage river, the Bonnet Plume may, over time, attract a level of recreation use that exceeds either the physical carrying capacity of the resource or the social carrying capacity of the user.

The potential for over-use of river corridors is already acknowledged to be an issue on other Yukon rivers by adventure wilderness guides (Robertson 1992). A variety of measures can be undertaken to prevent such impacts through education, regulation and the establishment of user behaviour policies.

The second type of land use which may compromise wilderness values involves mineral exploration. The intent of mineral exploration is to discover and define sufficient mineralisation to warrant bringing a mine into production. Large amounts of land are accessed for exploration and some environmental impacts will occur. Most of these are mitigatable with modern industry practices, when used.

In the Bonnet Plume, over 30 kilometres of the main stem of the river have been staked in the heart of the watershed. A number of mineral occurrences within the larger watershed are now considered deposits with defined grades and tonnage.

The mineral potential of the region is considered high (Hulstein and Emond 1994, Abbott 1994, Thorkelson and Wallace 1995) suggesting the likelihood of further discoveries. The implications for management planning and wilderness conservation are significant. First, some of the coal and lead-zinc deposits may be mined by open-pit methods. Open pit mining requires bulk shipping and, in the case of the Bonnet Plume watershed, substantial investment for all-weather access and infrastructure. Some of the major deposits are also in the heart of the Bonnet Plume valley in areas with high wildlife, recreation and scenic values.

The third land use activity is road construction. All-weather access is essential for future mine development but presents the greatest risk to the conservation of wilderness values. The cumulative impacts of roads, both positive and negative, will depend on the route and method of transportation chosen, as well as how the road is used and managed.

The very remoteness of the Bonnet Plume watershed has afforded a level of "natural" protection for its many wilderness values. The management plan must identify the information needs and attach the appropriate research priority to obtaining the information necessary to define wilderness values and protected area needs.

The data collected should be presented in mapped form so it can contribute to regional land use planning, watershed management and development assessment in a meaningful way.

The necessary baseline information is not currently available or in a form that can contribute to these regulatory processes from either a conservation or industrial use perspective.

2.5.3 Physiography, Landforms & Climate

Situation Analysis

The upper and largest portion of the drainage lies within the Wernecke Mountains. It is characterised by steeply incised narrow valleys and rugged mountain peaks. Where the river originates, in the Backbone Ranges of the Mackenzie Mountains along the Northwest Territories border, summits exceed 2100 metres. The only glaciers in the region are limited to this cluster of peaks which also constitute one of the few glaciated regions along the divide. West of the divide, the Wernecke Mountains reach heights of 2515 metres. Mt. Macdonald near the headwaters of Corn Creek rises to over 2,400 metres and dominates the surrounding area. Small alpine lakes perched in cirques and hanging alpine valleys separate rugged peaks with sharp cliffs, steep talus slopes and unusual occurrences of hoodoos, caves and other erosional features. The mountains separate the boreal forest to the south, and sub-arctic forest to the north.

During the last ice age, it was these mountains which prevented further northward movement of the continental glaciers. At these higher elevations, alpine tundra and birch-willow shrubland dominate where vegetation exists. As the river drains north and westward, the valley widens out into a U-shaped valley. Black and white spruce can be found in valleys below 1200 metres.

Oswald & Senyk (1977) describe the transition from the Wernecke Mountains to the lowlands of the Peel River as quite dramatic. Discontinuous permafrost is present throughout the Bonnet Plume watershed. Frost related features such as peat plateaus, palsa and earth mound features, distinctive polygon patterns, solifluction lobes and rock glaciers stand out.

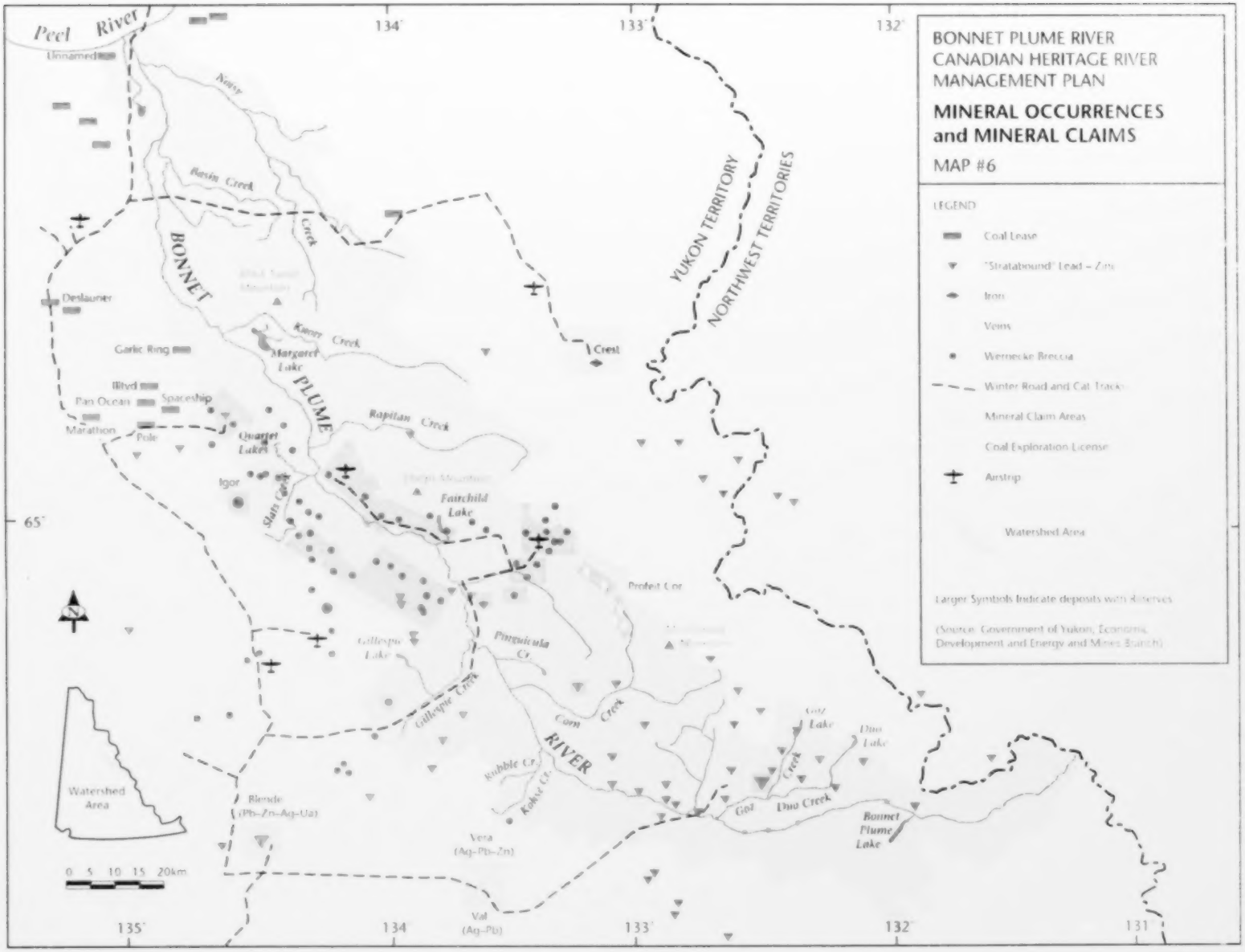
The central portion of the Bonnet Plume River was left unglaciated during both the McConnell and Buckland glacial periods with ice advancing from the south. Nearly all the valleys in the Wernecke Mountains were occupied by ice flowing in a north-westerly direction during the last two advances. The range of glacial features from mountain cirques to terminal and lateral moraines outline the river's glacial history and provide a range of interpretation opportunities along the river.

Stevens & Milne (1973) note that earthquakes with a seismic magnitude of up to 6.5 on the Richter scale have been recorded in the Mackenzie Mountains south of the Peel River near the territorial border. Whether such activity accounts for the massive slide on the upper Bonnet Plume River is unknown.

No specific climatological studies have been undertaken in the watershed. Annual precipitation in the upper reaches of the Bonnet Plume is estimated to vary between 635 and 760 mm and declines to approximately half where the river exits the mountain ranges onto the Peel River Plateau. Snow depth forces wildlife to move from the headwaters to the lower portions of the river during the winter. Oswald & Senyk (1977) note that cold air appears to pool in mid elevation valleys stunting tree growth in the valley bottoms and creating distinctive air inversion boundaries further up-slope. Bonnet Plume Lake opens up about June 20th and freezes over about October 10th (Widrig Pers. comm.).

The level of information available is sufficient for resource planning and general visitor interpretative purposes.

View towards Fairchild Lake (A. Jones)


BONNET PLUME RIVER
CANADIAN HERITAGE RIVER
MANAGEMENT PLAN
MINERAL OCCURRENCES
and MINERAL CLAIMS
MAP #6
LEGEND
Coal Lease
"Stratabound" Lead – Zinc
Iron
Veins
Wernecke Breccia
Winter Road and Cat Tracks
Mineral Claim Areas
Coal Exploration License
Airstrip
Watershed Area
Larger Symbols Indicate deposits with Reserves
(Source: Government of Yukon, Economic Development and Energy and Mines Branch)
Peel River
Unnamed
Nasty
Basin Creek
Creek
BONNET
PLUME
RIVER
YUKON TERRITORY
NORTHWEST TERRITORIES
Deslauriers
Garlic Ring
Illyd
Pan Ocean
Spaceship
Marathon
Pole
Quartet Lakes
Igor
Slats Creek
Kanny Creek
Margaret Lake
Crest
Rapitan Creek
Fairchild Lake
Gillespie Lake
Gillespie Creek
Pinguicula Cr.
Corn Creek
Rubble Cr.
Kaket Cr.
Goz Lake
Duo Lake
Goz Creek
Duo Creek
Bonnet Plume Lake
Blende
(Pb–Zn–Ag–Ua)
Vera
(Ag–Pb–Zn)
Val
(Ag–Pb)
Watershed Area
0 5 10 15 20km
65°
135°
134°
133°
132°
131°

2.5.4 Geology & History of Exploration

Situation Analysis

Resource exploration has occurred in the Bonnet Plume watershed since the late 1800's. Prospectors and explorers discovered coal and lignite while First Nations people discovered gold in gravels (Zaslow 1975). Since the 1960's, the Wernecke Mountains, including the Bonnet Plume area, have been one of the principal regions of mineral exploration and claim staking in the Yukon (Thorkelson and Wallace 1995). Between 1970 and the early eighties when exploration reached a peak, about 30 prospects had been drilled and evaluated. Exploration during this period focused on copper, cobalt, uranium, lead molybdenum, zinc, silver and gold.

Several of these occurrences **(Map 6)** are now considered deposits with defined grades and tonnage. In the following decade, falling world metal prices discouraged exploration in such remote areas. Exploration interest rebounded between 1993 and 1996 as metal prices rose and new geological theories were developed. Immediate interest in the region has again declined in 1997 with a drop in prices.

The Bonnet Plume watershed is geologically interesting because it includes Proterozoic sedimentary rock (>1.3 to 0.5 billion years old) within younger, (500 - 100 million year old) Palaeozoic and Mesozoic rock formations (Wheeler and McFeeley 1991). The south-eastern two-thirds of the region contains ancient sedimentary rocks of the Mackenzie Platform (a tectonic element of ancient North America).

These sedimentary rocks are composed of four stratigraphic units, and from oldest to youngest, include the Wernecke Supergroup, the Pinguicula Group, the Windemere Supergroup and a unit comprised of carbonate and sandstone. These sedimentary rocks have been intruded by younger igneous and rare volcanic rocks.

The north-west third of the region is underlain by younger sedimentary rocks, which occur as a structural depression known as the Bonnet Plume Basin (Norris and Hopkins 1977). Together the rocks of the Bonnet Plume region record about one billion years of intermittent sedimentation, interrupted by periods of uplift and erosion, and in some cases, deformation, magmatism and mineralisation (Thorkelson and Wallace 1995).

Additional baseline mapping of the regional surficial geology would complement the other resource evaluation studies proposed in the management plan.

2.5.5 Vegetation

Situation Analysis

None of the vegetation species identified to date are considered endangered.

The plant communities associated with the Bonnet Plume River and its valleys are typical of the boreal sub-arctic flora of the north central Yukon.

At the upper reaches of the drainage, open stands of white spruce with an understory of shrub birch, willow and lichen are common. On terraces of coarse soil materials on the higher floodplain, communities of shrub birch and lichen occur, with occasional mature white spruce.

The dominance of white spruce prevails until Rapitan Creek, where scattered larch and black spruce begin to appear on poorly drained sites on both sides of the floodplain[8].

Further downstream, near the out-take to Margaret Lake, extensive stands of pure black spruce dominate. Mixed coniferous/deciduous stands of white and black spruce, paper birch and alder are also common in the vicinity of Margaret Lake. This is a marked contrast from the input at Bonnet Plume Lake, where higher elevation and a colder climate present a subalpine landscape.

The only vascular plant research in the Bonnet Plume watershed has occurred at a reconnaissance level. In August 1992, 18 sites were sampled by C.E. Kennedy along the main stem of the river, and a short distance inland on the floodplain. As well, some collecting was carried out on hikes above the valley floor and on tributary drainages.

[8] Larch has a sporadic distribution throughout the Yukon. In the past, its occurrence in the Bonnet Plume River valley has been cited as rare, but is actually common in other parts of the Peel River drainage (Cody, Pers. comm.)

The cursory nature of most field studies conducted to date is not adequate for conservation biology or watershed management purposes.

This very brief investigation yielded a relatively high number of new plant records, some of which are particularly uncommon in the Yukon as a whole, or previously not known to occur in this part of the territory.

It also revealed the presence of various plant species at either the northern or southern limits of their range. Range extensions are of particular interest to taxonomists (and often to surficial geologists) because they further define the phytogeography of a species and may provide information regarding limits of glaciation. In the Bonnet Plume drainage, species at the northern limits of their range have migrated from boreal regions further south, and include *Carex filifolia, Senecio scheldonensis, Goodyera repens* and *Actaea rubra*. Species at the southern limits of their range have migrated from the arctic, and include *Oxytropis campestris* ssp. *jordalii* (Cody, Pers. comm.).

Of special interest in the Bonnet Plume watershed is the presence of an endemic species, *Boykinia richardsonii*.* This new record represents its easternmost locale in its range. This species is indicative of an eastern intrusion of Beringia into the Peel River drainage. This part of the Yukon was ice-free during the Pleistocene, the last major ice advance, approximately 10,000 to 14,000 years ago. This endemic is considered a "Beringian" species, only known to occur in those areas of the Yukon and Alaska which were not glaciated during the last ice age.

Also of interest to river travellers may be the occurrence of larch, numerous orchids, and Beringian and arctic species not commonly observed on other Yukon river trips in central or southern Yukon. The river may appeal to visitors with a special interest in botany, due to the incidence of rare species and species at the limit of their range.

It is significant that a very limited opportunity for collecting vascular plants during this one field trip yielded so many species of interest. One previous field survey of lichens and bryophytes in portions of the Peel river drainage including the Bonnet Plume, also turned up a number of species thought to be rare in the region (Bird et al 1977; 1980).

Further collections would be required to confirm the status of the species collected during the 1992 reconnaissance survey. As with many remote locations in the Yukon, first-time records of plants in the Bonnet Plume watershed may seem unusual until more collections in the locale are made. Species can be considered rare in the Yukon or Canadian context, but may be locally abundant. It is important for more work to be done to identify the presence and status of any rare, threatened or endangered species in the area. Of particular interest to First Nations are plants used for traditional and medicinal purposes.

The connection between wildlife habitat, vegetation, fire history, wildlife presence and seasonal movement patterns requires clarification. This relationship is critical to the identification of special management areas and the assessment of land use impacts on wilderness and heritage river values. A more detailed picture of the watershed's forest resources and fire history would also be beneficial and can be derived from ecosystem studies.

Based on the limited information currently available, it can be suggested that visitors to the area be encouraged not to trample sensitive sites (e.g. moist seepage sites with fine-grained substrates) which may provide habitat for certain types of species. For example, a variety of orchids (one of which has been identified as rare) were observed growing together on the riverbank of the main stem of the river near the confluence of Rapitan Creek. Locations such as this would commonly be used as campsites.

Given the potential for mineral development in the watershed, it would also be advisable to investigate plant community dynamics and determine baseline conditions immediately, in certain locations. Where significant mineralisation is known to exist, and exploration is occurring, it would be worthwhile to initiate some test-site rehabilitation research in advance of potential development.

* Collection of *Boykinia richardsonii* was made by Martyn Williams, August 1992.

2.5.6 Fish & Wildlife

Situation Analysis

Both First Nations have indicated a desire to ensure sustainable fish populations and minimise habitat loss.

The fish resources of the Bonnet Plume River have been spot sampled. Water sampling and seining by Elson (1977) recorded the presence of Arctic grayling, slimy sculpin, round whitefish and Dolly Varden within the river. Margaret Lake, which is not connected to the river, contained lake whitefish, lake trout and northern pike. Bonnet Plume Lake, which is connected to the river, contained round whitefish, lake trout and Arctic grayling. Bodaly and Lindsey (1977) note that the Peel River basin is a unique glacial refugium containing many relict fish populations. The authors conclude from the biochemical and morphological evidence collected during their study, that at least six species now inhabiting the region originated from types which either came from the Yukon River system or developed in situ, in unglaciated parts of the Peel.

The Peel River is known to support a substantial domestic fishery in the summer and fall. It is believed that fish migrate up the Peel and spawn in the major tributaries such as the Bonnet Plume River (Dryden et al. 1973).

The lower portion of the Bonnet Plume River is considered sensitive and valuable fish habitat (LGL Ltd. 1981). Dolly Varden and slimy sculpin over-winter in this area because of the extensive channel braiding, presence of groundwater which keeps sections open all winter, and associated build-up of aufeis which diverts water into side channels through the bush.

The fish resources of the Bonnet Plume River continue to be utilised seasonally, on a subsistence basis by both the Nacho Nyak Dun and Tetlit Gwich'in.

While fishing is not a primary activity among other user groups it is typically associated with other forms of recreation such as hunting, hiking and river travel.

Harvest levels by all users appear to be quite modest. For resource management and monitoring purposes, there is a need to confirm in greater detail the baseline resource condition. Further sampling and habitat mapping of the main river and principal lakes augmented with the inclusion of First Nation traditional knowledge would facilitate river management objectives.

In the context of the Yukon, the Bonnet Plume watershed is noted for its wildlife habitat and healthy, resident, large mammal populations. Caribou, sheep, moose, and bear (both grizzly and black) are present. The area is generally inaccessible except by aircraft and received little scientific attention until 1970. Concerns over mining interest and exploration activity prompted a few small-scale studies of woodland caribou, sheep and raptorial birds.

Caribou are common throughout the Bonnet Plume drainage. The river is home to the Bonnet Plume herd, one of the largest sedentary woodland caribou populations in the Yukon. Russell and Farnell (1984) estimate herd size at 5000 animals but indicate that very little is known about the herd, its range, movements or population parameters. However, some key seasonal caribou habitat has been identified in the Fairchild Lake area in the vicinity of active mineral exploration sites.

In addition to the Bonnet Plume herd, the Hart River herd to the west is thought to move through parts of the watershed, and it is possible that portions of the Redstone herd to the south-east use an area above Coz Creek, near the headwaters of the River (Widrig, Pers. comm.). Long term studies of the movement patterns of the Porcupine Caribou herd indicate they use portions of the lower Bonnet Plume valley as winter range on an infrequent basis.

Although there is good caribou habitat throughout the area, activities of the Bonnet Plume caribou appear to be focused in the Knorr Creek area. Caribou are found here during the spring movement, post-calving and pre-rut periods (Russell and Farnell 1980). In a 1979-80 study, caribou were observed utilising sub-alpine vegetation in September, with a preference for gentle slopes and high plateaus.

It is suggested that a general north-east shift in range may occur from summer to fall for the caribou in the Bonnet Plume and Wind River systems (Russell and Farnell 1980). In the winter, the caribou move below Fairchild Lake and into the lower valley where snow depth is significantly lower (Widrig Pers. comm.).

"I don't think there have been enough surveys in the parts of the watershed occupied by sheep, to make a judgement about sheep density or distribution"
(local outfitter)

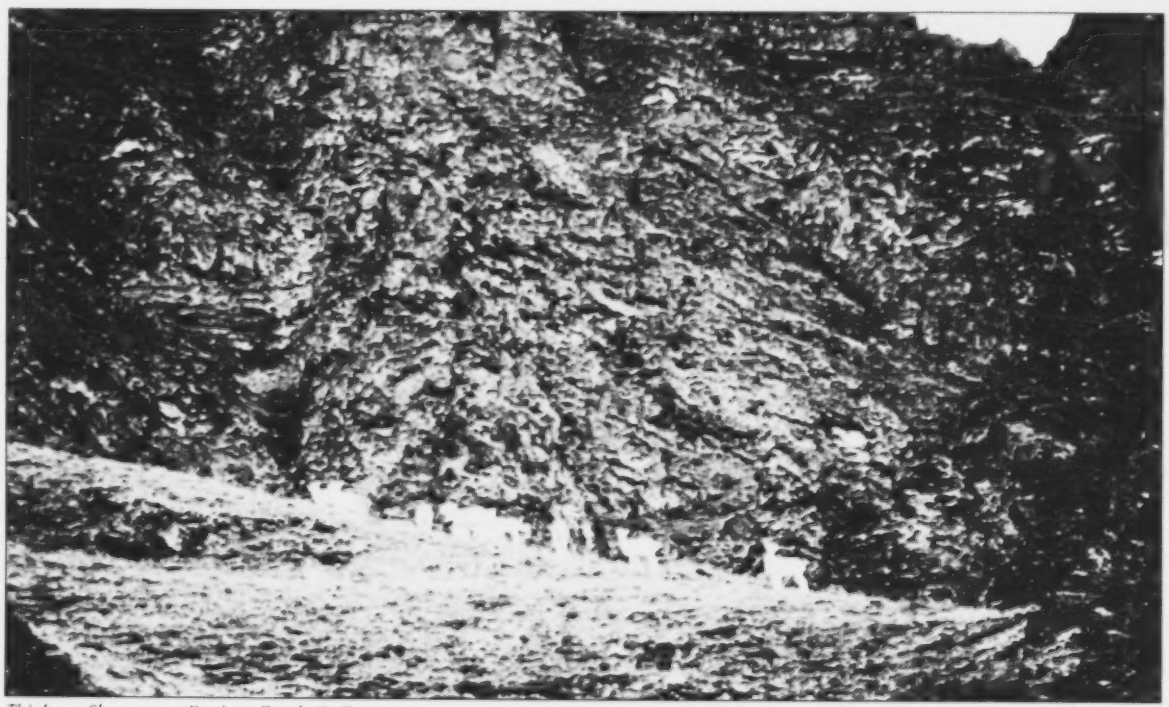
Sheep are spotted frequently in the middle reaches of the Bonnet Plume valley, particularly in the vicinity of Delores, Rapitan and Ram Creeks and around Margaret Lake (Smith Pers. comm.). They have been surveyed in the Knorr Range, on the north face of the Wernecke Mountains, along the Illtyd Range and along the Wind River. Sheep trails are also visible in many other parts of the watershed. (Carey 1987).

The Wernecke Mountains are considered important habitat for thinhorn sheep which prefer the steep cliffs and talus slopes common in the area. A survey in 1987 suggested the density of sheep was low in the watershed, with discontinuous distribution (Carey 1987). However, the survey was conducted only in the Nadaleen and Rackla ranges where heavy winter snows usually create unsuitable habitat for sheep.

The considerable wetland area on the lower reaches of the river provides attractive winter range for sheep, moose and caribou. Moose habitat improves downstream towards the Peel River where moose are frequently spotted on the large riparian flats. A long time Chappie Lake area trapper reports that large numbers of moose frequent this location (Elias Pers. comm.). A 1980 wildlife survey indicated that moose used these lakes during late summer. Well worn moose trails were observed along valley bottoms in the Wernecke Mountain area (LGL 1981). Smith (Pers. comm.) believes wolves are more scarce today than they were in the 1960s and 1970s.

Local outfitters report relatively high densities of grizzly bear (Widrig and Smith Pers. comm.). This is supported by the 1987 sheep survey which revealed bear diggings on all but north facing slopes in the Wernecke Mountains. Land Use Information Series (LUIS) maps identify a ridge east of the Bonnet Plume River, north of Rapitan Creek and south-west of Knorr Creek as an area continually used by grizzly bears for denning.

Raptor surveys along the main river were conducted in the mid-eighties and again during 1995. The wetland areas in the lower Bonnet Plume watershed provide suitable habitat for duck, geese, swans and loons but no population studies have been conducted.



Thinhorn Sheep near Rapitan Creek (B. Downie)

Trapping records indicate that marten, lynx, beaver, river otter, wolverine, mink, fox and wolves have all been trapped in the watershed. The watershed is also within the range of coyotes, ermine, least weasels, four species of shrew, two additional species of lagomorphs (rabbits, hares) and nine additional species of rodents (LGL Ltd. 1981).

Very little information exists on bird species in the Bonnet Plume watershed.

The Mayo District Renewable Resources Council completed a three year Integrated Big Game Management Plan in 1993. The Plan focuses on the habitat and management intervention needs of moose, caribou, wolf, sheep and grizzly bear populations. The Plan looks at the need for population inventories, habitat protection measures and the implications of fire and land use on habitat productivity. Population inventories and harvest data are linked to management zones and harvest issues. Communication, wildlife viewing and education are also discussed. The Big Game Management Plan supports the designation of the Bonnet Plume as a heritage river. It also provides a context for setting research priorities and defining co-management initiatives in the Bonnet Plume watershed from a conservation biology perspective.

The presence of a healthy grizzly bear population is often described as one indicator of wilderness quality. In general, grizzly bears require large areas of wilderness with minimal human disturbance (Craighead 1976, cited in Axys 1995). Home ranges are considered to be dynamic, varying in configuration and location from year to year, particularly in the case of male bears, and typically consist of a mosaic of several relatively dissimilar habitats (Craighead and Mitchell 1982, cited in Axys 1995; IGBC 1987). Seasonal feeding habitats, security cover, travel corridors, and denning habitat are essential components (Axys et al. 1995).

In the Bonnet Plume watershed, no bear studies have been undertaken to confirm population estimates, range and seasonal movement patterns. While grizzly bear harvest levels have remained relatively stable from year to year, the MDRRC Big Game Management Plan acknowledges that population estimates are only deductions based on the availability of suitable habitat. Harvest data suggests female kill levels may be near their maximum whereas only 40% of available males appear to be taken. Thus, if grizzly bears are to be used to monitor wilderness health, temporal habitat use and the effects of hunting pressure will have to be examined and correlated with the type, extent and timing of land use activity occurring in the watershed. Anecdotal information based on sightings is often an over-estimate of population (Lynn-Lawson, Pers. comm.).

Researchers also suggest that there may be a correlation between increased sightings and a destabilised population (Lynn-Lawson Pers. comm.). Therefore, researchers caution against relying on anecdotal data for management planning purposes in the Bonnet Plume watershed.

Other evidence suggests the healthy wildlife populations in the Bonnet Plume watershed are due in part to the area's isolated location and absence of roads. The argument that roads bring increased hunting pressure and fragment essential wildlife habitat, has also been made (Horejis 1995; Peepre Pers. comm.). This suggests more basic habitat inventory and assessment work needs to be done (Peepre, Pers. comm.).

In this context, wildlife research will need to provide information that can contribute to the assessment of potential impacts associated with increased recreation use (both consumptive and non-consumptive) and possible mining development in the central core of the watershed. The early identification of key habitat relationships, seasonal use and movement patterns could help the mining industry continue to carry out their exploration activities with the minimum amount of impact. At the same time, the information required to put forward proposals for protected area status or special management policies will be available.

2.5.7 Rare and Endangered Species

Situation Analysis

No systematic inventories of the Bonnet Plume watershed have been undertaken which focus on the identification of the presence of rare or endangered wildlife and vegetation species.

The Committee on the Status of Endangered Wildlife in Canada (COSEWIC) defines an endangered wildlife species as one which is threatened with imminent extinction throughout all or a significant portion of its Canadian range.

The likelihood of discovering rare plants within the Bonnet Plume watershed is good given the physiographic history of the area.

A threatened species is one that is likely to become endangered if the factors affecting its vulnerability are not reversed. A vulnerable species is one that is particularly at risk because of low or declining numbers, small range or some other factor such as pollution as in the case of the peregrine falcon.

The grizzly bear, of all the known wildlife species present in the Bonnet Plume watershed, is most at risk over the long term given its dependence on large, intact, wildland ecosystems for survival. The watershed also contains a number of relict fish populations from the Beringia refugium including a lake whitefish stock now confined to Margaret Lake.

Douglas et al. (1981) defines rare and threatened plants as follows. Rare plants are defined as ones that have a small population within a defined area. A rare plant may be restricted to a small geographic area, where it may be locally common, or it may occur in small numbers dispersed over a wide area.

A threatened plant species is one that is likely to become endangered within the foreseeable future over all or a significant portion of its range, if the factors affecting its vulnerability are not reversed.

Rare plants recorded to date in the Bonnet Plume watershed include: the saxifrage *Boykinia richardsonii,* a Beringia refugium species at the eastern limits of its range.

Also present in the watershed are *Papaver walpolei,* a vascular plant considered rare in Canada and threatened in Alaska (Argus and Pryer 1990), and three more species listed as rare in the flora of the Yukon (Douglas et.al. 1981), *Erigeron hyssopifolius, Cypripedium calceolus ssp. parviflorum,* and *Potentilla pensylvanica.*

The proximity of the area to Beringia, the pattern of past glaciation, and the limited amount of botanical research that has been conducted suggest the possibility exists that additional rare or unusual occurrences of plants will be found within the Bonnet Plume watershed. The region's remoteness, wilderness character and limited visitation mean the ecosystems have remained relatively intact.

Given the cost, time involved and complexity of this type of research, the management plan challenge is to identify research priorities. The first priority should be to concentrate on the main stem of the river where most recreational use is likely to occur and in areas of active mineral exploration.

2.5.8 Water Resources

Situation Analysis

As a Canadian Heritage River, protection of the quality, quantity and rate of flow of the Bonnet Plume River is a management priority. Water quality in the Bonnet Plume River remains in its natural state. Water flow also remains unaltered with no impoundments present. Water connects all other components of the ecosystem serving as the pathway to integrate all physical, biological and chemical processes.

Boykinia richardsonii (C. Kennedy)

Localised activities can have widespread and cumulative impacts on the aquatic environment. Declining water quality can be a good early indicator of broader resource degradation. Many factors affect water quality including river morphology, precipitation levels, seasonal discharge and groundwater infiltration rates and surficial geology. For example, because much of the lower Bonnet Plume watershed is underlain by permafrost, infiltration losses are minimal and runoff following rainstorms is very rapid. Records from the hydrometric station above Gillespie Creek indicate 80% of the annual run-off is concentrated in the five month period between May and September. Peak flow for the year usually occurs in late May after spring break-up with snowmelt providing the major portion of flood runoff.

Environment Canada has operated the hydrometric station above Gillespie Creek since 1981. In 1992 and 1993 water quality samples were taken here during the summer and winter. Parks Canada personnel took additional samples along the river during a field trip in the summer of 1992. Extensive sampling programs are cost prohibitive and of questionable value for heritage river management purposes because the river remains in its natural state.

Budget constraints have forced Environment Canada to close the Gillespie Creek hydrometric station. While there is sufficient time series data on river flows for management purposes, there is insufficient information to confirm baseline water quality conditions, establish water quality parameters or conduct trend analysis.

A synoptic study of the main stem of the river was completed in 1997. This will assist water scientists to describe the current character of the river in water quality terms and set appropriate future water sampling standards for planning and management purposes.

The factors most likely to affect water quality or flow changes include:

- fire induced solifluction in the lower Bonnet Plume valley resulting in massive slumps;
- seismic activity triggering landslides; and
- flooding triggered by unseasonable weather conditions during spring melt.

Placer and quartz mining and forestry on a large scale also pose potential risks. However, both federal and territorial legislation (i.e. *Fisheries, Yukon Waters* and *Environment Acts*) include measures to minimise these potential impacts.

On a smaller scale, and usually on a site specific basis, concentrated recreational use can have a localised effect on water quality. Unsanitary practices and improper disposal of waste water on a consistent basis are typical concerns documented in the literature.

DIAND Water Resources has completed a reconnaissance level survey of the main stem of the river to help determine appropriate testing and monitoring parameters for the river[10].

[10] The field work was completed in 1997 with the final report expected to be completed early in 1998.

Water sampling in Gillespie Creek, 1996 water quality study. (B. Slater)

2.5.9 Protecting Landscape Views

Situation Analysis

The river system contains some outstanding landscape features within the physiographic regions through which it flows. Maintaining the natural quality of the wilderness environment presents a range of management issues depending on the land use activity involved. The location of airstrips, cabins, trails, exploration camps, tote roads and seismic lines need to be considered. For the river traveller, one important concern is the "view" from the river. River travellers do not want to see signs of previous recreation use or exploration activity. Defining important viewpoints and key features along the main stem of the river needs to be a priority as use increases. More detailed research is needed to develop appropriate guidelines for the protection and interpretation of key watershed features. Landscape management is important in areas where there are conflicting uses.

2.5.10 Cultural Heritage Protection

Situation Analysis

The incorporation of First Nation history, traditional knowledge and management experience is central to the development of the Bonnet Plume Management Plan. Systematic studies have not yet been undertaken though there is an extensive history of traditional use by the Nacho Nyak Dun and Tetlit Gwich'in people.

The traditional Peel River and Mayo people followed the shifting caribou migration within the upper Peel drainage meeting during their annual seasonal travels. Elders indicate a trail crossed through the Bonnet Plume valley linking both First Nations.

"Pingo" shaped gravel deposit near Fairchild Lake (A. Jones)

The Bonnet Plume region was an area of overlapping interest for the Tetlit Gwich'in and ancestors of the present day Nacho Nyak Dun. As such it was utilised for travel, meetings, inter-tribal trade and food supply.

Elders describe the presence of hotsprings in the lower Bonnet Plume valley and indicate their significance as spiritual, healing sites for humans and wildlife. Special protocol and reverence were practised when approaching or entering the hot springs. The location of the springs referred to is not known and there are no references to their presence in the available literature.

Count V.E. de Sainville made the first recorded Euro-american trip up the Bonnet Plume River in 1893. After placer gold was discovered on the Klondike River in 1896, many parties came to Dawson City through the Peel River drainage (Slobodin, 1962). Stampeders stopped off along the way or came back to explore other creeks once the Klondike fever had died down. In the Bonnet Plume area many characters associated with early prospecting and mining are remembered, such as Hard Rock McDonald, Chicago Tom and Cadillac Mike (Brown, 1989).

Early Euro-americans also engaged in trapping in the Bonnet Plume area and this tradition continues today. Trappers, prospectors and travellers were frequently dependant upon local First Nations for transport, guiding and help in emergencies. In fact, the Bonnet Plume River was named after Andrew Flett Bonnetplume, a Gwich'in Chief, who worked for many years as an interpreter for the Hudson's Bay Company. He and his band made their home on the Bonnet Plume River. Bonnetplume gave assistance to many of the unfortunates caught by winter on the trail to Dawson City and they named the river after him (Coutts, 1980).

Historic sites, objects, and any work or assembly of works of nature or of human endeavour that has value for its archaeological, paleontological, pre-historic, historic, scientific, or aesthetic features are protected under the *Yukon Archaeological Sites Regulations* (under the *Yukon Act*) and the *Historic Resources Act*.

The purpose of the *Historic Resources Act* is to promote appreciation of the Yukon's historic resources and to provide for the protection and preservation, the orderly development, and the study and interpretation of those resources. It is illegal, in Yukon, to disturb and/or remove artifacts from cultural sites.

The Gwich'in Social and Cultural Institute is a non-profit society established by the Tetlit Gwich'in to document oral history and traditional knowledge. It has both a research and educational mandate and has initiated a range of projects relevant to Tetlit Gwich'in interests in the Peel River drainage. It is the logical Gwich'in agency to co-ordinate research initiatives to resolve current information gaps.

Gwich'in and Nacho Nyak Dun elders suggest that traditional campsites, grave sites and old deadfall traps can be found throughout the river valleys. The general consensus is that thorough archaeological and historic site inventories of the Bonnet Plume area are warranted before conclusions are drawn about its human heritage significance (Hughes et.al. 1981; Gotthardt, Pers. comm., 1995; Olynyk, Pers. comm., 1995). Both First Nations believe a comprehensive cultural survey of the Bonnet Plume watershed is essential to understanding the importance of the river from a First Nation's perspective and appreciating its true heritage values. Given the age of many elders, compiling a comprehensive oral history is the first priority.

In 1996 GeoHeritage Planning Consultants prepared a cultural thematic framework which could be applied to all rivers within the Canadian Heritage Rivers System. This study identified seven broad cultural heritage value themes and 22 sub-themes which, if present, merit consideration in management planning. This study was followed by a report in March 1997 which included a preliminary assessment of the cultural heritage values of the Bonnet Plume River[1]. **Table 2** has been adapted from the 1997 Geoheritage Planning report applying their methodology and thematic categories.

[1] The Bonnet Plume assessment was based only on existing information derived from the initial nomination document and the initial draft of this management plan. As noted, no systematic cultural heritage inventory has been completed and this has been identified as a priority in this management plan.

"It is important to realise the relationship between the land, the animals and the First Nation people. Every aspect of life that the Tetlit Gwich'in and the Nacho Nyak Dun people carried out was with great respect and appreciation of what was given to them by the Creator. It is believed that the caribou were created for the people. Their migratory habits were intertwined with the people's annual life patterns. Summer was the time for fishing and harvesting berries and roots. Trapping and hunting caribou and larger game animals was carried out in the fall and winter. In the spring, waterfowl would be harvested and both groups moved back to their favourite fishing camps. The Bonnet Plume region was a great provider and the people respected all living things of that place" (Louise Profeit-LeBlanc, 1994)

The thematic categories listed in Table 2 are:

Resource Harvesting

1.1.1 Aboriginal fishing (including camps, weirs, smoke houses)
1.2.1 Trapping of beaver (including trap-lines)
1.2.2 Trapping other edible or fur bearing aquatic animals
1.2.3 Hunting caribou at crossing places
1.2.4 Hunting of waterfowl (including the collection of eggs)
1.3.2 Collection of seeds, roots, plants for food and medicinal purposes

Water Transport

2.1.1 Navigable channel itself (including portages)
2.1.2 Human or wind-powered commercial freight and passenger transport (including aboriginal canoes etc.)
2.1.5 Cargoes (including trade goods)

Riparian Settlement

3.1.3 Shoreline seasonal settlements (including aboriginal encampments)
3.2.2 Archaeological evidence of shoreline aboriginal settlements

Culture and Recreation

5.1.1 Ritual or ceremonial structures
5.1.2 Sites of recurring spiritual or ritual activity (including healing springs)
5.1.3 Spirit-dwelling places
5.1.4 Burial grounds

Jurisdictional Uses

6.1.4 Evidence of commercial exploitation without government charter

Environmental Regulation

7.4.1 Aboriginal rights and claim settlements affecting water use rights and entitlements

TABLE 2–Cultural Heritage Values and Rating Bonnet Plume River

Cultural Heritage Value	Theme(s)	Physical Location	Historic Significance	Condition	Functional Relationship (x)	Total Score	Rare
Aboriginal subsistence activities(hunting, fishing, trapping, berry and resource gathering)	1.1.1, 1.2.1, 1.2.2, 1.2.3, 1.2.4, 1.3.2	2.5	1.5	1.0	2.5	12.5	
Trappers cabins	1.2.1, 1.2.2	2.0	1.0	2.0	1.5	7.5	
Aboriginal transportation route (Mayo to Fort McPherson)	2.1.1, 2.1.2, 2.1.5	3.0	1.0	2.5	3.0	19.5	
Gold Rush route to Klondike	2.1.2	3.0	1.0	1.0	2.5	12.5	
Mining exploration camps	6.1.4	1.0	1.0	1.5	1.5	5.25	
Seasonal settlement	3.1.3, 3.2.1	1.0	1.0	1.0	1.5	4.5	
Land Claim Settlement	7.4.1	3.0	3.0	1.0	3.0	21.0	
Spiritual and symbolic uses	5.1.1, 5.1.2, 5.1.3, 5.1.4	1.5	1.0	1.0	1.0	4.25	

Notes: A comprehensive cultural resource inventory would likely significantly alter this preliminary assessment . This rating m ethodology does not accurately acknowledge the First Nation cultural perspective or reflect their traditional knowledge. Without that input and a comprehensive inventory, rarity and significance can not be accurately determined. For more detail on how the methodology is applied, consult the report. The full citation is listed in the bibliography.

Resource harvesting and water transport remain the dominant theme categories while the sub-themes of river navigation and aboriginal rights/claim settlements stand out. The claim settlement sub-theme receives the highest rating because establishment of a heritage river and an accompanying management plan are specific land claim implementation obligations. Similarly, settlement of the two affected claims is of national significance. Clearly, a systematic study of traditional land use is a priority need.

2.5.11 Recreation & tourism

Situation Analysis

A diversity of natural resource values throughout the Bonnet Plume River drainage contributes to a correspondingly high level of water and land based recreational potential. Originating in a high alpine area of the Mackenzie Mountains along the NWT/Yukon border, the Bonnet Plume River flows down through a gradually widening valley to join the Peel River on the Peel Plateau at an elevation some 2,000 metres below its source. This difference in elevation increases the variety of environments through which the river passes. Each has its own special recreational potential.

The Bonnet Plume River has been reported as one of the premier whitewater wilderness canoe rivers in Canada and attracts a small, international clientele (Madsen & Wilson, 1989). The river is technically challenging (frequent Class II and III rapids with isolated Class IV and V) and provides opportunities for related recreational activity. The trip down the Bonnet Plume River takes between 7 and 9 days starting from Bonnet Plume Lake.

Many parties continue on down the Peel to Ft. McPherson (total trip length 520 km) taking 14 to 18 days. Less than 50 people a year are thought to travel the river at this time. Camping, day hiking, nature study, and photography are important components of this river based activity.

Fishing is an important secondary activity in the Bonnet Plume watershed and is typically associated with other forms of recreation such as hunting, hiking or river travel. Bonnet Plume, Duo and Goz lakes, in the upper reaches of the drainage basin, provide good angling opportunities for grayling and lake trout. Similarly, the lowest of the Quartet Lakes, Chappie Lake, and Margaret Lake are historically important fishing locations in the lower reaches of the valley. The river channel itself has moderately good fishing for grayling, especially at creek mouths and eddies.

Opportunities for land based recreational activities such as hiking, mountain climbing, ski touring, camping, nature study, wildlife viewing, big game outfitting, photography, and scenic appreciation exist everywhere in the watershed and are of exceptionally high quality.

Hiking middle section of the river (B. Downie)

As recreation use increases, the carrying capacity of the land and resources becomes an issue. Less than 100 people a year currently travel to the Bonnet Plume area to hunt, hike, fish or travel the river.

Two big game guiding areas are found in the Bonnet Plume watershed. An international clientele is attracted, spending 10 to 14 days travelling between tent camps in the valley. Sheep, grizzly and black bear, caribou and moose are the primary targets with wolf and wolverine occasionally taken. Outfitters take between 40 and 55 hunters into the Bonnet Plume watershed each year and believe present use levels sustain a high quality experience (Widrig Pers. comm.).

Broad expansive views, a diversity of landforms, landscapes and vegetation communities, as well as extensive wildlife populations enhance the recreational opportunities available. The Yukon Recreation Features Inventory Maps, completed in 1988, identify numerous sites and areas of high recreational feature significance in the Bonnet Plume River watershed (J.S. Peepre and Associates and Juan de Fuca Environmental Consultants, 1988). These sites and areas merit detailed examination to put them in context with other resource values and their temporal and spatial needs. For example, the preservation of key wildlife habitat may conflict with other visitor use activities in one season and not another.

In other situations, resource values may complement each other suggesting the opportunity for designation of special management areas, territorial parks or other mechanisms to meet conservation and resource protection objectives.

Unique features may include canyons, waterfalls, areas of aufeis, mineral licks, fossil beds, hoodoos and habitat indicating the presence of rare plants or wildlife.

Other Yukon rivers are already exhibiting the stresses associated with increased use including garbage and sanitation problems, habitat degradation and crowding (Loeks Pers. comm.). In a wilderness environment, the limits of acceptable change are by nature less tolerant. Heritage river status for the Bonnet Plume will promote river use, although float-plane access limits river entry and exit points. The management plan needs to promote the type of research and management activities that minimise potential problems. For example, some options for activity impact monitoring are: providing the right type of pre-trip information on no trace camping techniques, requiring trip party registration and maintaining campsite condition records.

2.6 Economic Opportunities & Obligations

2.6.1 First Nation Economic Development Measures

The Nacho Nyak Dun Final Agreement outlines economic development measures and provisions for allocating licenses, permits or grants for outfitting, commercial fishing (other than salmon fishing), or other uses of natural resources in the Nacho Nyak Dun traditional territory (Chapter 22, Schedule A). The objectives of these measures are to provide band members with opportunities to participate directly in the Yukon economy, develop self-reliance, and gain the greatest possible economic benefit from their Settlement Agreement.

The settlement legislation calls for the preparation of economic development plans which:

- maximise opportunities for training and identify the experience that Yukon First Nations People will require to take advantage of the economic opportunities generated by their Settlement Agreement;
- maximise the use of available financial and technical resources;
- identify the funding requirements and measures necessary to stimulate community level economic activity; and
- identify opportunities for the Nacho Nyak Dun First Nation to be involved in resource harvesting activities and make investments in areas such as transportation, culture, communication, agriculture, renewable resource services, energy and mining development, industry and tourism.

Government and the Nacho Nyak Dun First Nation shall jointly undertake the preparation of a regional economic development plan for the traditional territory of the Nacho Nyak Dun First Nation (Chapter 22, Schedule A, Part I, Section 3.0).

Preparation of the regional economic development plan will involve the Village of Mayo, existing commercial and industrial interests, and other residents within the Nacho Nyak Dun First Nation traditional territory. Among other things the regional economic development plan will examine the state of the economy in the traditional territory, assess the potential for development in the areas of communication, culture, transportation, agriculture, renewable and non-renewable resources and tourism, and recommend appropriate types of economic development.

The Nacho Nyak Dun Agreement clearly requires nomination for heritage river status for the Bonnet Plume. However, such status was not intended to necessarily preclude consideration of other land uses which may provide economic benefit to First Nations people anywhere in their traditional territory. Of particular interest to CHRS designation are the following provisions which allow for strategic investments or direct participation in a range of potential economic opportunities including outfitting, commercial wilderness recreation and non-renewable resource development.

The Nacho Nyak Dun First Nation have the option to acquire up to 25 percent of governments' interest in a non-renewable resource or hydroelectric project which commences construction after February 14, 1995 in their traditional territory. They also retain a right of first refusal to acquire new commercial freshwater fishing permits or licenses in their traditional territory until they have 25 percent of the commercial freshwater fish quota.

It is assumed that a commercial freshwater fish quota will be established whenever commercial freshwater fishing permits or licenses are issued in an area or for a particular river or lake (Chapter 22, Schedule A, Part II, Section 1.0).

If government establishes a quota for a sector of the commercial wilderness adventure travel industry in the traditional territory, the Nacho Nyak Dun have the right of first refusal to acquire new licenses or permits using a formula set out in the Final Agreement. It is assumed that a definition of existing wilderness adventure travel operators will be established in consultation with Yukon First Nations and the wilderness adventure travel industry, prior to establishing a quota for this sector of the commercial wilderness travel industry (Chapter 22, Schedule A, Part II, Section 2.0).

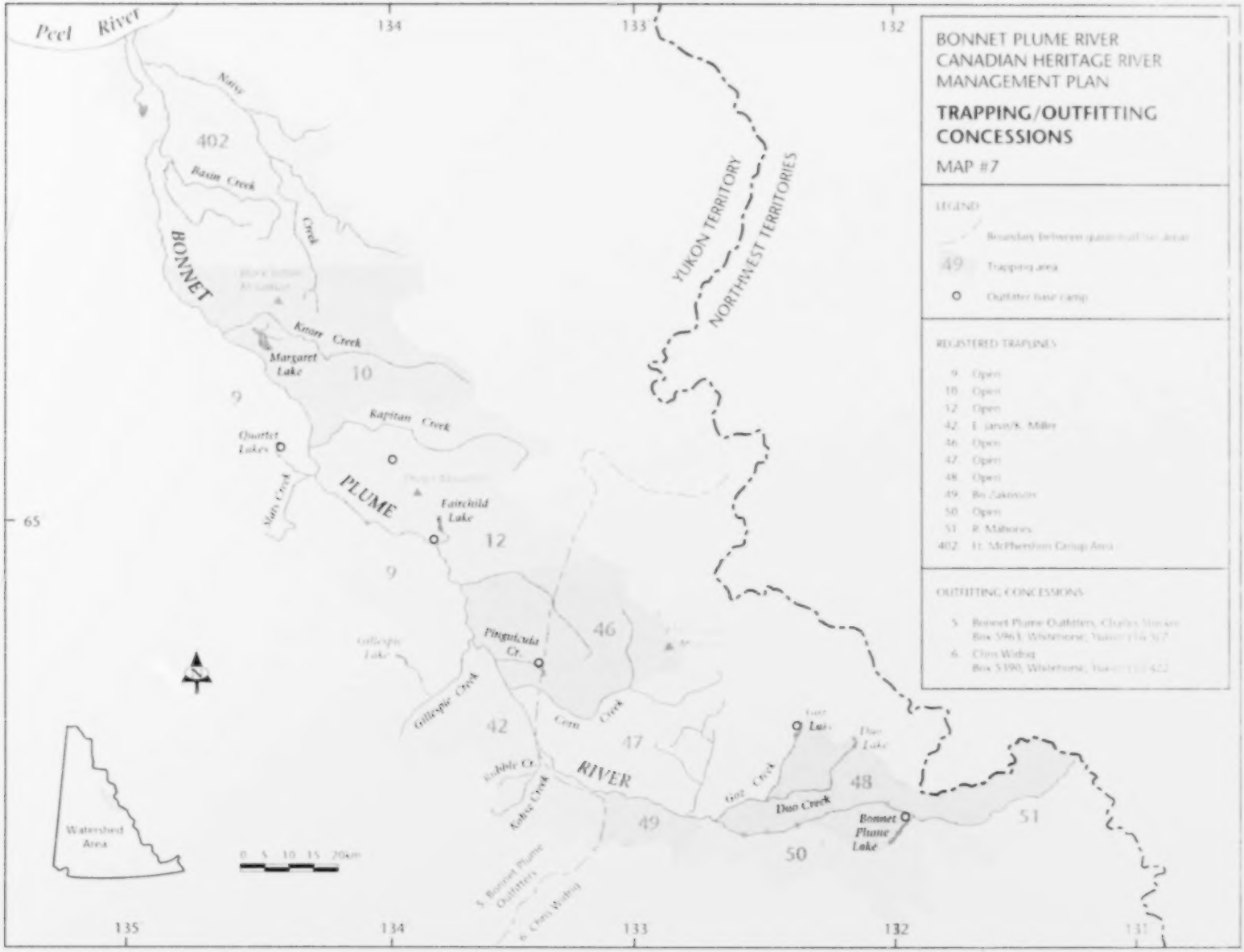
If the government establishes a quota for the commercial freshwater sports fishing industry in the traditional territory, they also have a right of first refusal to acquire new licenses or permits in the same method as for the wilderness adventure travel industry (Chapter 22, Schedule A, Part II, Section 3.0).

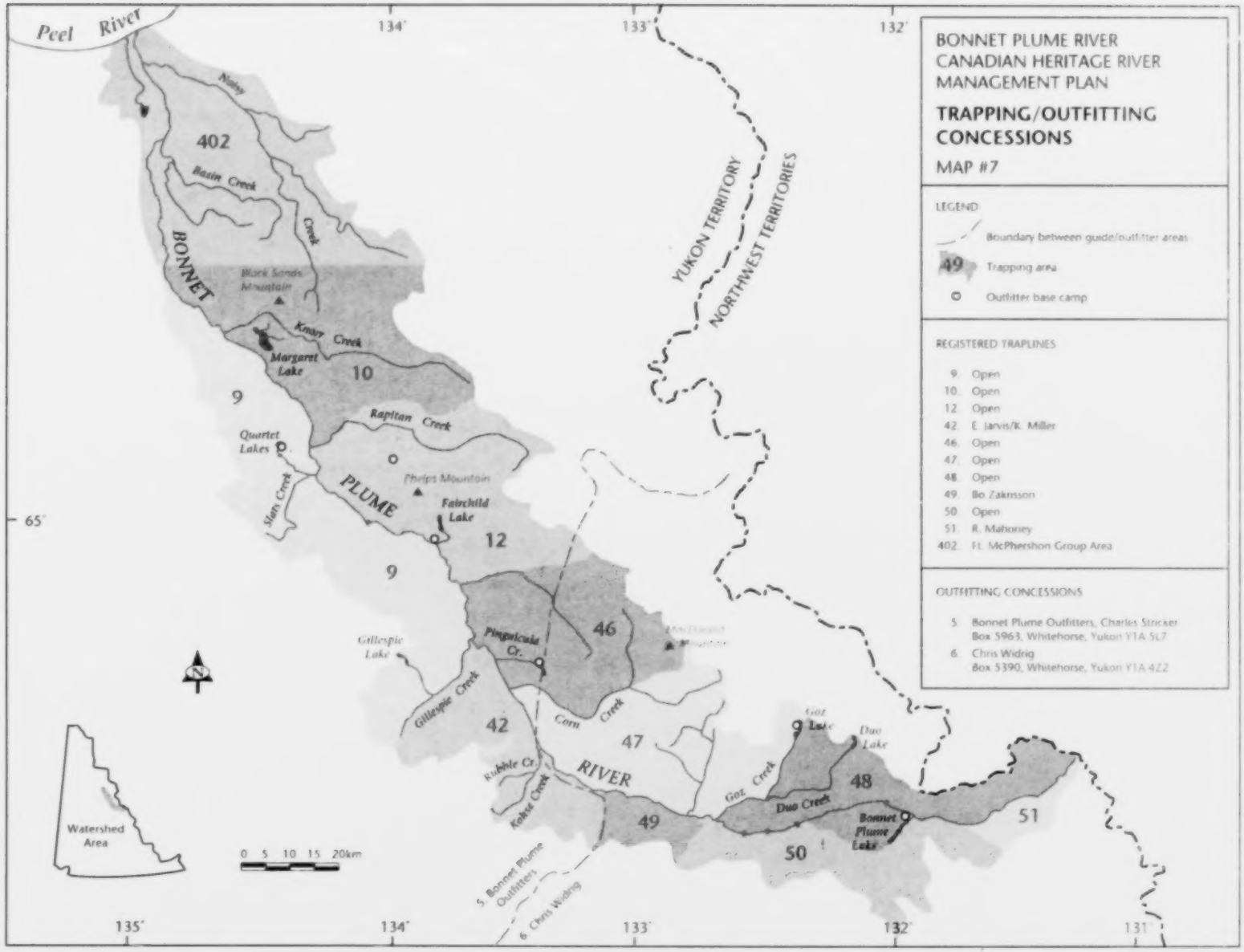
Government in consultation with the Nacho Nyak Dun First Nation will also decide when, and in what manner, any such limits or other restrictions are required for commercial activities within the scope of Chapter 22, Schedule A, Part II.

In making a decision of establishing limits and/or terms and conditions applicable to the commercial wilderness adventure travel industry and for commercial freshwater sports fishing, Government and the Nacho Nyak Dun First Nation will consider (Chapter 22, Schedule A, Part II, Section 4.0):

- the number of existing operators in the sector for which a quota or other limit is being considered;
- the carrying capacity of that sector to accommodate additional operators, including the Nacho Nyak Dun First Nation and Nacho Nyak Dun owned firms;
- whether a delay in introducing a quota or other limit would affect the ability of the Nacho Nyak Dun First Nation and related firms together to hold 25 percent of the quota;
- the objectives stated above; and
- such matters as the parties may agree.

The trans-boundary interests of the Tetlit Gwich'in are recognised in the provisions of both First Nation Land Claim Agreements. The Tetlit Gwich'in interest includes title to lands in the lower Bonnet Plume watershed near the confluence of the Peel River and direct involvement in management decisions which affect its use, planning and management.


Peel River
134
133
132
135
131
65
Nasty
402
Basin Creek
BONNET
Creek
Knorr Creek
Margaret Lake
10
9
Raptan Creek
Outfitt Lakes
Main Creek
PLUME
Fairchild Lake
12
9
Gillespie Lake
Pingaticula Cr.
46
Gillespie Creek
42
Corn Creek
47
Rabbit Cr.
Rabbit Creek
RIVER
Goz Creek
Goz Lake
Duo Lake
48
Duo Creek
Bonnet Plume Lake
49
50
51
YUKON TERRITORY
NORTHWEST TERRITORIES
Watershed Area
0 5 10 15 20km
5. Bonnet Plume Outfitters
6. Chris Widrig
BONNET PLUME RIVER
CANADIAN HERITAGE RIVER
MANAGEMENT PLAN
TRAPPING/OUTFITTING CONCESSIONS
MAP #7
LEGEND
Boundary between quarter-half-tier areas
49 Trapping area
Outfitter base camp
REGISTERED TRAPLINES
9 Open
10 Open
12 Open
42 E. Jarvis/K. Miller
46 Open
47 Open
48 Open
49 Bo Zakinsson
50 Open
51 R. Mahoney
402 H. McPherson Group Area
OUTFITTING CONCESSIONS
5. Bonnet Plume Outfitters, Charles Stewart
Box 5963, Whitehorse, Yukon Y1A 5L7
6. Chris Widrig
Box 5390, Whitehorse, Yukon Y1A 4Z2


Peel River
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65°
135°
131°
Nisling
402
Basin Creek
Creek
BONNET
Black Sands Mountain
Knorr Creek
Margaret Lake
10
9
Rapitan Creek
Quartet Lakes
Phelps Mountain
Slam Creek
PLUME
Fairchild Lake
12
9
Gillespie Lake
Pingualuit Cr.
46
Gillespie Creek
42
Corn Creek
47
Rabbit Cr.
Kaska Creek
RIVER
Goz Lake
Duo Lake
Goz Creek
48
Duo Creek
Bonnet Plume Lake
49
50
51
5. Bonnet Plume Outfitters
6. Chris Widrig
YUKON TERRITORY
NORTHWEST TERRITORIES
Watershed Area
0 5 10 15 20km
BONNET PLUME RIVER
CANADIAN HERITAGE RIVER
MANAGEMENT PLAN
TRAPPING/OUTFITTING CONCESSIONS
MAP #7
LEGEND
Boundary between guide/outfitter areas
49 Trapping area
Outfitter base camp
REGISTERED TRAPLINES
9. Open
10. Open
12. Open
42. E. Jarvis/K. Miller
46. Open
47. Open
48. Open
49. Bo Zakrisson
50. Open
51. R. Mahoney
402. Ft. McPherson Group Area
OUTFITTING CONCESSIONS
5. Bonnet Plume Outfitters, Charles Stricker
Box 5963, Whitehorse, Yukon Y1A 5L7
6. Chris Widrig
Box 5390, Whitehorse, Yukon Y1A 4Z2

2.6.2 Wilderness Adventure Travel

The growth potential of wilderness adventure travel is limited by two factors. The first is the carrying capacity of the resource base and the river's ability to sustain use. The second consideration is perceptual, dependent on visitor attitudes and expectations in a wilderness environment. This is the social carrying capacity. The limits of acceptable change are the subject of much research and public debate. Assuming an average party size of 4 to 6 people, this means less than 10 travel groups are currently using the river. Thus there is likely significant growth potential.

Taken together, trail riding, canoeing and rafting attracted approximately half of all adventure travellers in Canada during 1993– Tourism Canada: An Overview of Adventure Travel in Canada March 1995

Tourism Canada reports that adventure travel is the fastest growing sector of the tourism industry in North America. As recently as 1993 the adventure travel sector recorded a growth rate of 12.9% over 1992 – and all indicators suggest that high rates of growth will continue (Tourism Canada 1995). In the same year, the Yukon ranked sixth in Canada in the number of adventure travel operators.

Tourism Canada estimated adventure travel to the Yukon in 1993 generated gross revenues of $5.7 million dollars. Tourism Yukon is responding to the market growth potential accordingly. Areas such as the Bonnet Plume watershed are predicted to maintain steady, continuous user growth.

The Bonnet Plume and other Peel River watershed tributaries need to be considered relative to other northern rivers, in terms of what they offer. Wilderness recreation by definition implies a limit on the number of users to prevent degradation of the environment and the experience of users.

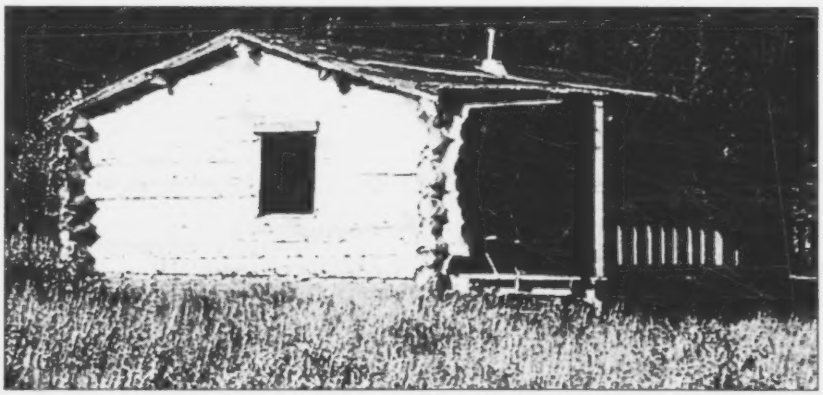
The Bonnet Plume watershed is not perceived to be near its inherent carrying capacity compared to other destination rivers because of its relative isolation. What the carrying capacity is remains to be determined (Peepre Pers. comm.).

The Government of Yukon has released a draft bill entitled *"The Wilderness Tourism Licensing Act"* for discussion purposes. The legislation is intended to require all operators of wilderness tourism activities to be licensed. The proposed regulations gives government the authority to establish guide skill and certification standards. Operators can be required to meet standards, keep records and follow procedures deemed necessary to ensure the uncrowded and pristine Yukon wilderness remains sustainable. Passage of this legislation will facilitate future planning and management of river travel on the Bonnet Plume by requiring commercial operators to provide the needed trip report data that is currently not available.

Additional work should be undertaken to determine the tourism market potential, carrying capacity and visitor use management needs. In particular, a system for recreational use monitoring must be put in place.

2.6.3 Outfitting

Between 40 and 55 hunters use the two outfitting operations on the Bonnet Plume River each year **(Map 7)**. Both outfitters have indicated this represents the optimum level of use, allowing for a sustainable balance between visitor hunting experience and wildlife harvest levels. Interest in trophy hunting has levelled off and is not expected to increase in coming years. The room for growth lies in non-consumptive recreation such as wildlife viewing, trail riding, hiking and fishing when hunting is not in progress.



Outfitters cabin Bonnet Plume Lake (B. Downie)

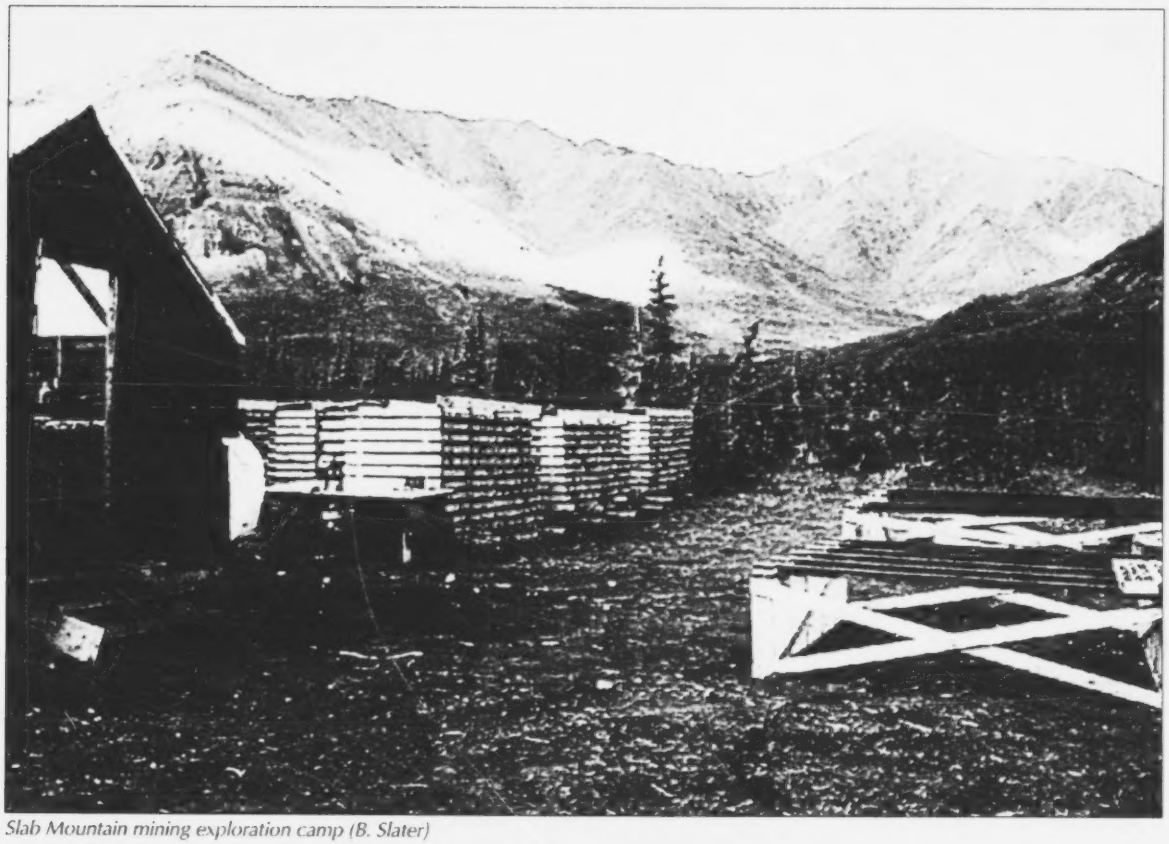
2.6.4 Inherent Value of Wildlands

The long term value of clean water, healthy wildlife habitat and populations, as well as the ability to carry on traditional economic activities such as hunting and fishing, must be considered as economic benefits that arise from the protection of wild nature and biodiversity. The difficulty lies in attempting to quantify these values for the purpose of economic analysis. Such values can be grouped as: existence value (knowing that an area continues to exist, even though we will never visit it), option value (knowing it exists so we can visit it at some point in the future) bequest value (knowing it's there for future generations), and others such as the value each individual places on natural beauty, recreation opportunity and biodiversity.

Most individuals rarely consider these values in monetary terms, nor are these values easily tradable as market commodities (Government of Yukon Economic Development 1996). On the other hand, the economic benefits of wilderness are underestimated when confined to profits from tourism and recreation. The effort must be made to consider economic values of wilderness when we assess alternative land uses in the Bonnet Plume watershed.

2.6.5 Mineral and Energy Resource Potential

The south-eastern Bonnet Plume area contains deposits and occurrences of stratabound copper-zinc-lead-silver and silver-lead-zinc veins. The area also contains the Wernecke Breccias: large areas of shattered rock containing interstitial fillings of iron minerals with copper, uranium, gold and cobalt (Hulstein and Emond 1994; Abbott 1994). There is also the potential for diamonds in the Wernecke Breccias, as diamond-bearing kimberlite rocks are known to occur in similar rocks to the east of the Bonnet Plume area (Erdmer and Downing 1992; Godwin and Price 1986).



Slab Mountain mining exploration camp (B. Slater)

There are 99 published mineral occurrences in the watershed. Zinc occurrences in the region are comparable with those of the Pine Point (NWT) area, which has an estimated tonnage of >60 million tonnes. They are also similar to deposits in the Faro area, which are believed to contain 58 million tonnes of ore. The GOZ CREEK deposit, located in the southern portion of the watershed, contains 11 million tonnes of 8% zinc with lead, cadmium, and silver also present (Yukon Minfile, DIAND, 106C020). Current exploration activity around Fairchild Lake in the central Bonnet Plume valley is focused on finding mineralisation comparable to the Olympic Dam deposit in Australia. (Abbott 1994). The Olympic Dam deposit is known to contain 2 billion tonnes of copper, uranium, gold and silver ores (Abbott 1994).Lead, zinc and silver veins in the region may be similar to the replacement deposit found at Sa Dena Hes (near Watson Lake). That deposit is estimated to contain 4.86 million tonnes (Coopers and Lybrand Ltd., 1993) while the Prairie Creek (NWT) deposit contains approximately 4.25 million tonnes (Abbott 1994). Silver, lead and zinc are also found in the COB and PROFEIT vein occurrences located in the south-central portions of the region.

No placer claims have been staked in the Bonnet Plume watershed. The Klondike Placer Miners Association believes activity is dependent on improved road access (Taylor Pers. comm.).

The Bonnet Plume Basin in the northern portion of the watershed hosts the largest coal deposits in the Yukon (Hunt 1994). There are two coal deposits with reserves in the watershed. The GARLIC RING contains 15 million tonnes of high volatile, bituminous C non-coking coal while an UNNAMED occurrence contains 1.4 billion tonnes of lignite (Hunt 1994).

An exploration program by Pan Ocean Oil Limited indicates the Bonnet Plume Basin contains a coal field of major proportions with measured, indicated and inferred in situ resources in excess of 650 million tonnes of high volatile bituminous C non-coking coal (Pan Ocean Oil 1981; McKinney 1985).

Long (1983) estimates there could be at least 1.4 billion tonnes of sub-bituminous coal in the same area. These coal deposits are believed to have the greatest potential for economic development over the next 20 years.

Several large oil and gas companies conducted exploration programs in the northern Yukon between 1950 and 1970 (Hulstein and Emond 1994). Although exploratory oil and gas wells have been drilled in the Peel River watershed, none have been drilled in the Bonnet Plume region. According to the National Energy Board (1994), the Bonnet Plume area has shallow targets, poor seals and only local preservation of possible source rock. The oil and gas potential for the region is rated as low.

While many factors will ultimately determine whether any of the mineral deposits in the Bonnet Plume watershed progress to the development stage, there are a number of implications for heritage river management. First, the level of mineral knowledge is much greater than for other resource values. Second, a high level of infrastructure is required for mineral development. Third, there are a number of potential deposits in reasonable proximity to each other that could become significantly more viable once basic infrastructure were in place. The potential cumulative impacts of multiple projects would be substantial as the areas of greatest mineralisation are in the heart of the watershed. Other factors are also beginning to be considered in determining project viability. These include life-cycle accounting methods which take into account social costs, public subsidies, and clean-up and restoration costs.

The management plan cannot ignore the possibility of future mineral development within the watershed. As the mineral potential of the area is considered high, continued exploration interest will continue. Eventually some of the existing deposits may become economically attractive. Heritage river designation implies an inherent conservation focus in management planning priorities. A need to ensure the impacts of ongoing exploration are also considered.

While there will be inevitable disagreement over the preferred outcome between industrialist and conservationist, there can be mutual agreement on the information requirements necessary for land use planning and development assessment. This can be one focus for management plan implementation because it supports rather than changes the regulatory review process.

Loss of the wilderness characteristics for which the river was nominated could bring about a review of the river's heritage river status.

3.0 IMPLEMENTATION STRATEGY

3.1 Research Priorities

Research priorities reflect the overall management plan goal and principal resource management objectives. Actions and priorities described in this section are organised into action steps described in the work programs (**section 4.4**). The remoteness of the area and its relative size (2.5% of the Yukon) will necessitate the consideration of a variety of research inventory techniques. The actions can be divided into three principal activities:

- baseline research to establish or confirm resource values, relationships, interpretative themes and performance standards,
- evaluating the quality of resource knowledge for land use planning and development assessment purposes,
- CHRS monitoring and implementation evaluation.

3.1.1 Baseline Research

Baseline research priorities need to focus on filling in the information gaps relevant to heritage river management within the Bonnet Plume watershed. The following deficiencies stand out:

- the absence of documentation on First Nation traditional use throughout the watershed, including place name identification, an inventory of culturally significant sites, and a comprehensive oral history;
- the need for additional wildlife habitat studies relating habitat significance to species use, population health, seasonal movement and harvest yield with priority given to grizzly bears and the need to co-ordinate research initiatives with implementation of the Mayo Region Integrated Big Game Management Plan;
- the absence of a systematic vegetation survey at the watershed level based on an ecosystem classification approach to define species diversity, habitat relationships, fire history, wilderness character and sensitivity to disturbance;
- the need to survey and characterise river morphology, and update fisheries information along the main stem of the river to meet land claim and CHRS status obligations;
- the need to update and refine the recreation features inventory; correlating the results with current and traditional use of the area;
- the desire to refine potential interpretative themes to reflect First Nation, government and CHRS watershed management objectives while ensuring the methods of delivery are appropriate to visitor needs, culturally appropriate and reflect the wilderness nature of the river;
- the absence of any baseline data on watershed entomology; and
- the need for a reconnaissance survey of paleontological resources in the watershed.

3.1.2 Land Use Planning & Development Assessment

Much of the data collected needs to be put in a consistent spatial and temporal format so it can be used in land use planning and development assessment. The Heritage River concept relies on existing regulatory processes and voluntary compliance. In the Bonnet Plume watershed, three types of land use changes can be predicted to potentially pose either direct or indirect risks to the river's heritage values. These are: inappropriate recreation use, improved access and mine development. Each of these uses results in changes to the ecology of the Bonnet Plume watershed and creates multiple and cumulative impacts.

The challenge is first, to define the information needs associated with such uses and second, identify proponent responsibilities within the current regulatory framework. Missing information relevant to the debate over land use compatibility, regional planning and development includes:

- the location, health and vulnerability of rare or endangered plant and wildlife species;
- the seasonal habitat requirements and movement patterns of fish and wildlife populations and their susceptibility to different development and harvest pressures;

- the identification of potential access routes into and out of the Bonnet Plume valley and their potential "zones of influence" which could affect important wildlife habitat, conflict with present wilderness use activities, or facilitate further development;
- the identification of possible "special management areas" such as parks, wildlife sanctuaries, ecological reserves, etc., to reduce wildlife vulnerability, and to protect rare or endangered species, unique landscape features, culturally significant sites, biological processes or wilderness values from encroachment by conflicting land uses;
- the definition of spatial and temporal relationships between watershed resources and land user needs such as the conservation of river traveller views, the provision of improved access and protection of critical habitat;
- a description of cumulative impact issues based on resource qualities, ecosystem health, competing land use interests, land claim and heritage river obligations, wilderness recreation carrying capacity and a definition of the limits of acceptable change;
- an evaluation of the effectiveness of previous mining exploration camp and claim site reclamation efforts;
- the definition of co-operative research protocols and data collection standards so research conducted by the private sector, a non-profit agency or government agency can be shared without duplicating research efforts; and
- the identification of significant archaeological and paleontological sites to enhance land use planning and development assessment processes or resource protection.

This information will assist proponents to undertake either development or conservation initiatives and improve the timeliness of any proposal reviews under the development assessment process.

3.1.3 Monitoring Limits of Acceptable Change

The parameters for monitoring need to be defined and agreed upon by all parties. The federal and territorial governments, with input from the MDRRC, have the primary responsibility to oversee management plan implementation and co-ordinate monitoring activities. However, watershed users can play a role and contribute within their means. The resident outfitters, trappers, and First Nation people, as well as geologists and others, who regularly travel the river can participate if roles and responsibilities are well defined.

The remoteness of the area and its relative size (2.5% of the Yukon) could make both inventory and monitoring techniques expensive and time consuming. Thus the use of co-operative partnerships will be essential. The challenge is to ensure the principles of co-operative management are carried through with inter-agency and private sector co-operation.

Monitoring requirements need to be defined for three categories:

- those related to the health of the watershed ecosystem and biodiversity;
- those associated with monitoring levels and type of land use activity, and
- those related to monitoring the limits of acceptable change.

For example, if the health of grizzly bear populations is to be used as one indicator of wilderness quality, as is suggested in much of the wildlands management literature, then specific baseline research will be necessary. This research should examine both the individual and collective impacts of various land and water use activities on grizzly bears as well as the relationship between bear populations and other wildlife in the watershed. Similarly, if a declining bear population represents a measure of unacceptable change, then the monitoring mechanism chosen must be able to anticipate trends and establish causes. Typical reasons include hunting pressure and displacement resulting from habitat loss.

Other measures may not necessitate additional work. For example outfitters and trappers already provide harvest data and this combined with census surveys and new habitat data may provide a sufficient measure of habitat quality, species diversity and population stability for general CHRS management purposes.

3.2 Research Zone Priorities

Zoning is a management implementation tool that is commonly used throughout the CHRS to help manage the tension between use and preservation. It is a common technique used in land use planning to ensure the majority of designated lands are protected in their natural state with the minimum of man-made disturbances.

At this point, there is insufficient information to define appropriate management zones from a land use control perspective. The land claim settlement legislation provides for the creation of a regional land use planning process. The application of zoning within the Bonnet Plume watershed at this time would be premature and should be an outcome of that regional planning program.

An alternative is to use zoning to identify research priorities and define the level of research effort based on current land use activity and river use. In this scenario, initial research efforts would focus on:

- the main stem of the river and the areas surrounding the main lakes;
- areas currently under active mineral exploration, along existing trails, tote roads and other potential access corridors;
- areas identified as having high recreation and wildlife value or of known cultural or ecological significance.

In this approach, areas of active mineral exploration have the same research priority as areas of particular ecological interest because the information collected will be needed for land use planning and development assessment purposes. In this way industry can take the lead in collecting biophysical data in their areas of interest. This will leave government and others to concentrate on matters such as the management of recreational use and the identification of key wildlife habitat and other locations requiring special management area status.

Bonnet Plume Lake (A. Jones)

4.0 IMPLEMENTATION PLAN

4.1 Life of the Management Plan and Plan Review

This management plan focuses on the management research actions required to meet the Heritage River Integrity Guidelines and fill the information gaps needed for resource management, future regional land use planning and project development assessment.

The *Canadian Heritage Rivers Guidelines* requires a periodic review of management progress. The Yukon Parks Branch will be responsible for co-ordinating the filing of an annual report with the CHRB. The content of this report will include information on changes in resource condition, river integrity concerns and current program activities. Information on activities outside the watershed which have a significant impact on river integrity will also be discussed. The pace of implementation will be influenced by the degree of inter-agency co-operation, the extent of development pressure and the preference given to plan implementation by agencies faced with competing priorities in a time of economic restraint.

During the course of the five year life of this plan, a proposal for industrial development or, conversely, for the creation of an area subject to higher standards of conservation, may arise. It is important that such a development be subject to public consultation through an open and transparent process.

"Every ten years, or more frequently if the Board deems it appropriate, managing agencies will make detailed assessments of the condition of designated rivers"–CHRS Guidelines

4.2 Implementation Work Programs

The implementation of this plan is dependent on action by a variety of federal, territorial and First Nation government agencies, and on input from the regional management boards established under the terms of the First Nation of Nacho Nyak Dun Final Agreement and the Tetlit Gwich'in Comprehensive Land Claim Agreement.

A tripartite Steering Committee representing the governments of Canada and Yukon and the Mayo District Renewable Resource Council is proposed to oversee plan implementation. The MDRRC provides the focus for local participation and co-ordination. The management plan is based on the premise that collected data, and completed studies relevant to watershed management should be accessible to any interested party. It is the responsibility of the Steering Committee and MDRRC to ensure such information is shared.

The following work program summaries link plan objectives to specific action steps identifying what work must be done. Lead and support roles are described and a timeframe established along with expected outcomes. Within the schedule, the timeframes for a variety of actions are identified as follows:

Short Term actions	1-2 years after designation date
Medium Term actions	3-4 years after designation date
Long Term actions	greater than 5 years after designation date

4.3 Agency Identification

Parks Branch, Renewable Resources, Government of Yukon, will be the primary agency responsible for management plan implementation co-ordination. The Parks Branch will work in concert with federal government agencies and the MDRRC in an effort to ensure that the river is managed according to the objectives of this management plan.

Agencies whose interests relate to various aspects of heritage river management plan implementation are listed below. Those which have specific mandates are referenced in the work programs.

CMI – Commercial Interests (mining companies, outfitters, wilderness adventure tourism operators etc.)

CI – Conservation Interests

PC – Parks Canada

DED – Department of Economic Development (Yukon)

DFO – Department of Fisheries and Oceans (Canada)

DIAND – Department of Indian Affairs and Northern Development (Canada)

DWR – DIAND Water Resources (Canada)

EC – Environment Canada

DRR – Department of Renewable Resources (Yukon)

DT – Department of Tourism (Yukon)

GSCI – Gwich'in Social and Cultural Institute

MDRRC – Mayo District Renewable Resources Council

NND – Nacho Nyak Dun First Nation

PRWAC – Peel River Watershed Advisory Committee

PCMB – Porcupine Caribou Management Board

TG – Tetlit Gwich'in First Nation

YPC – Yukon Placer Committee

YTG – Yukon Territorial Government

YTWB – Yukon Territory Water Board

4.4 Work Programs

See following pages

4.4.1 Work Program – Natural Heritage Resources

Goal: To maintain the integrity of the watershed ecosystem

Objective: To complete baseline resource inventories and characterise the nature of the resources present

Concern Addressed: Absence of comprehensive, integrated biophysical information required for detailed watershed planning, management and assessment purposes; need for information on species composition, health, spatial and temporal distribution; need to share information in a timely manner

Justification: Required to meet land claim settlement obligations for watershed protection; information needed to assess and compare resource significance, assess impacts of proposed developments, and identify heritage river management considerations(e.g. zoning) and establish monitoring procedures

Timeframe/Cost: Immediate priority, 3 to 5 years to complete all resource surveys and analysis; field costs will be significant given region's remoteness; some funding justifiable through land claim implementation obligations; minimum annual budget $50,000-75,000 to complete 2-3 studies per year

Action Steps	Page #	By Whom	When	Results Expected
Ecosystem Classification Study prepared	p. 21, 25, 31, 32, 35	YTG Renewable Resources lead, DIAND and CPAWS support	1996-1999 ** Field work started 1996	Inventory of vegetation, spatial distribution, health and quality; identification of potentially rare, threatened or endangered plant species and evaluation in a regional, territorial and national context
Survey and update water resource information	p. 36, 37	DIAND Water Resources & Environment Canada	1996-1998 ** Field work complete, report pending	Synoptic overview characterising river water quality, quantity and rate of flow; identification of potential water quality standards, monitoring frequency and event indicators which would trigger further specific study
Complete baseline habitat inventories for wildlife; co-ordinating surveys with Big Game Management Plan priorities; and cultural history inventories	p. 33-36, 38-40	YTG Renewable Resources, MDRRC lead; Local outfitters, Trappers, and Industry can co-operate and support	1998-2001	Wildlife habitat inventory describing key habitat, seasonal movement patterns, and spatial distribution provides baseline information for establishing visitor controls, identifying potential protected area requirements and facilitating land use planning and impact assessment
Complete wildlife population census and co-ordinate with data compiled from annual harvest surveys; visitor sightings and First Nation research	p. 33-36	YTG Renewable Resources, MDRRC lead; Local outfitters, trappers and Industry support	ongoing, target completion date 2001	Confirm species health, harvest levels, relationship to key habitat and seasonal movement patterns
Update and refine natural features and recreation potential inventory and correlate with other natural and cultural resource inventories; complete visual resource assessment along main stem of river	p. 23, 24, 26-31, 41, 42	YTG Renewable Resources lead, CPAWS, Industry and MDDRC support	1999-2000	Important views and key recreation features, definition of values worth conserving put forward and publicly discussed
Complete land use capability assessment of the watershed, including the associated impacts that could result if the renewable and non-renewable resource extractive potential is realised	p. 21-26, 46, 47	YTG Renewable Resources, DIAND lead, MDRRC, Industry land users support	1998-2001	Inventory of potential land use conflicts, spatial distribution and development potential for planning and impact assessment purposes
Hold workshop involving all stakeholders to assess completeness of resource inventories and resource capability assessments and determine implications of resource values for watershed management, protection	p. 18, 21, 22, 23, 48, 49, 50	YTG Renewable Resources, DIAND lead, MDRRC, Industry land users support	2000	Direction on next steps for watershed plan implementation, guidelines for resource use and application assessment
Develop *Limits of Acceptable Change Guidelines* and watershed monitoring procedures for resource management, planning and development assessment purposes	p. 21, 22, 24, 26-28, 38, 41-43, 45, 46, 48, 49	YTG Renewable Resources lead, DIAND, PC, MDRRC support	2001	Limits of Acceptable Change parameters established and river monitoring procedures set based on wilderness values for which the river was nominated

4.4.2 Work Program – Cultural Heritage Resources

Goal: To identify and reflect First Nation culture in all aspects of watershed management

Objective: To identify, record and reflect the cultural history of the Bonnet Plume in watershed management

Concern Addressed: Absence of a systematic inventory of First Nation current and traditional land use within the watershed; need to integrate traditional knowledge into resource assessment, management planning, and land use decision making processes

Justification: Land Claims Agreement obligation; recognition of special significance of area to First Nations; window of opportunity to collect oral history from elders decreases with each passing year

Timeframe/Cost: Immediate priority, 2-3 years to complete; $40,000-60,000 budget required

Action Steps	Page #	By Whom	When	Results Expected
Undertake systematic survey of main stem of the river; collect oral history and inventory culturally significant sites, place names	p. 24, 38-40, 48, 50	YTG Tourism, Heritage Branch, NND lead, Gwich'in Social & Cultural Institute support	1999-2000	Inventory of culturally significant sites, current and traditional land use for use in river management, land use planning and development assessment
Develop interpretative themes for the Bonnet Plume reflecting its cultural significance	p. 24, 38-40	YTG Tourism, Heritage Branch, NND lead, Gwich'in Social & Cultural Institute support	1999-2000	Development of cultural interpretative themes for the river and watershed
Revise and update CHRS Cultural Heritage Assessment	p. 38-40, 48	YTG Renewable Resources & Heritage Branch lead, NND, Gwich'in Social & Cultural Institute, PC support	2000	new CHRS Cultural Heritage Assessment standards met and ready for incorporation into updated management plan
Define monitoring standards for historic resources to ensure in-situ protection	p. 24, 38-40, 48-50	YTG Tourism, Heritage Branch, NND, Gwich'in Social & Cultural Institute	2000	Monitoring standards including methods, frequency and procedures established

4.4.3 Work Program – Recreation and Tourism Resources

Goal: To provide visitors with the opportunity to discover a distinctive ecological region of the Yukon and experience a wilderness river environment

Objective: To adopt appropriate management strategies and watershed protection measures to ensure a high quality wilderness river experience

Concern Addressed: Desire for backcountry and wilderness travel experience, potential for land and resource use conflicts; need to know resource and use; social carrying capacity; limits of acceptable change; river recreation over-use becoming a problem elsewhere in the Yukon

Justification: The above goal is one of the primary reasons for CHRS status, but that status could attract more use than the wilderness environment is capable of handling; type of recreation use can create problems or be in direct conflict with other land and river users

Timeframe/Cost: Medium term, $25,000-50,000 over 2 years

Action Steps	Page #	By Whom	When	Results Expected
Complete an assessment of the recreation and tourism market potential to determine appropriate carrying capacity and visitor use management measures	p. 24, 26-28, 41-44, 48-50	YTG Renewable Resources/ Tourism lead, CPAWS, Wilderness Adventure Industry, MDRRC support	1998-1999	Appropriate carrying capacity measures and management strategies identified to reflect market needs; along with physical infrastructure requirements compatible with wilderness trip experience Potential regional economic development opportunities and benefits defined
Prepare Wilderness Tourism Licensing Act	p. 24, 25, 41-43, 45	YTG Renewable Resources/ Tourism lead, Wilderness Adventure Industry support	1997-1998	Requires industry to report location, levels of use and adopt no trace camping procedures which will result in more timely and accurate information for planning and management purposes
Develop recreation use monitoring procedures	p. 24, 26, 27, 41, 42, 45	YTG Renewable Resources, DIAND lead, PC, MDRRC, NND and Industry support	1999	Specific monitoring procedures established to identify visitor use impacts and ensure limits of acceptable change are not exceeded and spatial/temporal impact minimised
Prepare Visitor Use Information, Backcountry Use Guidelines	p. 24-27, 38-42	YTG Renewable Resources, Tourism, DIAND lead, PC, CPAWS, NND, Industry support	1997-1999 ** some publications already translated	Establish interpretative materials, backcountry use guidelines, wilderness travel etiquette information in 4 languages
Develop procedures to track visitor use and recreational expenditure	p. 24-27, 41, 42, 45, 48-50	YTG Tourism with the Bureau of Statistics lead, Economic Development, MDRRC, Tourism operators support	1998-1999	Tracking mechanism in place to show benefits of wilderness conservation and value of CHRS status; compliance with proposed Wilderness Tourism Licensing Act

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6.0 APPENDICES

6.1 Appendix 1–List of Participants

The following is a list of individuals who participated on the Bonnet Plume Steering Committee and on the Bonnet Plume Advisory Committee.

BONNET PLUME STEERING COMMITTEE

Jim McIntyre, Government of Yukon, Committee Chair
Dan McDiarmid, Mayo District Renewable Resources Council
J.D. Randolph, Mayo District Renewable Resources Council
Bill Slater, Department of Indian and Northern Development, Secretariat, Peel River Watershed Advisory Committee

BONNET PLUME ADVISORY COMMITTEE

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Joe Charlie, Tetlit Gwich'in, Peel River Watershed Advisory Committee
Ron Cruikshank, Tetlit Gwich'in Land Use Planning Office
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Charlie Snowshoe, Tetlit Gwich'in
Theo Stad, Yukon Conservation Society
Mike Stammers, Pamicon Developments
Bob Sterling, Klondike Placer Miners Association
Charlie Stricker, Bonnet Plume Outfitters
Martin Swizinski, Keno City Community Representative
Frank Taylor, Klondike Placer Miners Association
Chris Widrig, Widrig Outfitters
Silke Wissner, Councillor, Mayo Village Council
Alan Young, Yukon Conservation Society

MANAGEMENT PLAN AUTHORSHIP

The management plan was updated, revised, and edited for publication on behalf of the Steering Committee by Inukshuk Planning & Development in association with Aasman Design Inc. of Whitehorse, Yukon.

6.2 Appendix 2 – Bonnet Plume Heritage River: Relevant Federal and Territorial Existing Legislation

The following are summaries of federal and territorial Acts which will have a direct bearing on the management of the Bonnet Plume Heritage River (taken from Tuak Environmental Services 1994).

6.1.1 Federal Legislation

Yukon Waters Act

The Yukon Waters Act enables the federal government to prohibit all types of land dispositions (e.g. sale, lease, license of occupation) for the protection of waters or to assist in undertakings that are in the public interest. The Water Board may be directed not to issue any licenses for specific waterways to facilitate comprehensive evaluation and planning with respect to those waters and where use and protection of the waters is required in relation to a particular undertaking which is in the public interest. Licenses issued pursuant to the Act are to respect the objects of conservation, development and use of waters in a manner that will provide optimum benefit for all Canadians and for residents in the Yukon in particular.

The *Yukon Waters Act* is designed to manage water resources in the Yukon, including regulation of water use and deposit of waste materials into Yukon waterways. To assist in administration, the Act establishes the Yukon Territory Water Board which is charged with receiving applications for water use/deposition of waste and, depending upon the type of license, for approving/disapproving applications or for recommending to the Minister of Indian and Northern Affairs Canada the approval or disapproval of water licenses. In completing its tasks, the Board is to provide for conservation, development and utilisation of waters in a manner that will provide the optimum benefit therefrom for all Canadians and for the residents of the Yukon in particular. (s.12)

The *Yukon Waters Act* is significant to the management planning of the Bonnet Plume Heritage River Designation in the following respects.

1. Water use and deposit of wastes into waters are authorised by approved water licenses which are issued in accordance with the Act and its related regulations. Domestic users and in-stream users are exempt from the licensing requirements respecting water use and no license is required when water is used to extinguish a fire or on an emergency basis, controlling or preventing a flood. (ss.8 & 9)
2. The Water Board cannot issue a license to an applicant until compensation that the Board considers appropriate, if any, has been or will be paid by the applicant. Compensation may be payable to domestic users, in-stream users, owners of property, occupiers of property and holders of outfitting concessions, registered trapline holders and others as indicated in the Act. Individuals who potentially may be compensated must be "in-place" at the time of application and must have notified the Board in accordance with the procedures outlined in the Act. (s.14(4))
3. Licenses issued may have attached conditions that the Board considers appropriate. The Board is to make all reasonable efforts to minimise any adverse effects on other licensees, domestic users, in-stream users, owners of property, occupiers of property, holders of outfitting concessions, registered trapline holders and others as indicated in the Act. (s.15(2))
4. The Board does not operate in a vacuum; in addition to the above limitations and others presented in the Act, the Minister may give written policy direction to the Board with respect to the carrying out of any of the Board's functions and the Board shall comply with such policy directions. Policy direction given by the Minister will not apply to applications that are pending before the Board or have been approved by the Board and are awaiting approval of the Minister. (s.13)
5. The Minister of Indian and Northern Affairs may enter into agreements with the Yukon Government providing for the management of waters flowing between the Yukon and the Northwest Territories. (s.7)
6. Governor in Council[12] may reserve from disposition all or any interests in any federal Crown lands (territorial lands) where the interests are required for protection of waters or in connection with any undertaking, the development or operation of which is in the public interest, and that would require the use of those interests in land and/or waters adjacent to those lands. (s.34(1)).
7. The Board may be directed not to issue any licenses permitting use of water or the deposit of waste directly or indirectly into any waters, to enable comprehensive evaluation and planning to be carried out respecting those waters or where use and flow of the water or the maintenance of the quality of the water is required in connection with a particular undertaking the development of which is in the public interest. (s.34(2))

Territorial Lands Act

The Territorial Lands Act enables the federal government to withdraw lands from all types of dispositions (e.g. grants, leases and license of occupation) for virtually any reason as long as the reason is stated on the withdrawal order. Withdrawal does not create a protected area per se, but may restrict use in certain respects. Nothing in the Act limits the operation of the Yukon Quartz Mining Act, the Yukon Placer mining Act and/or the National Parks Act. The statute also enables the creation of a land use control and permitting regime. The Territorial Land Use Regulations define this land use permitting regime.

[12] Governor in Council refers to cabinet decisions, termed 'orders' or 'minutes', which are given to the Governor General for signature. The decisions can take effect only after they have been signed by the Governor General.

The *Territorial Lands Act* provides for the control and management of federal Crown lands, including land dispositions, reservations and withdrawals. The implications for management planning and Heritage River designation are:

1. The land use and management regime established in the Act does not limit the operation of the *Yukon Quartz Mining Act*, the *Yukon Placer Mining Act*, the *Dominion Water Power Act* or the *National Parks Act*. (s.3(3))
2. The Act enables making of regulations respecting the protection, control and use of the surface of Yukon lands and the issuance of permits for the same (see *Territorial Land Use Regulations*, following). (s.5)
3. Sale of land greater than 160 acres and/or leases of greater than 640 acres must have the approval of the Governor in Council. (ss.11(1) and 11(2))
4. A 100ft strip of land, measured from the ordinary high water mark, is reserved from every grant of territorial land where the land extends to the shore of any navigable water or inlet. (s.13)
5. All mines and minerals, and the right to work the same, as well as the right to enter, use and occupy land as is necessary to work and extract the minerals, are reserved to the Crown from every grant of territorial lands. All rights of fishery, fishing and occupation of land for the purposes of fishing, are similarly reserved. (s.15)
6. Grants, leases and other dispositions of territorial land do not carry with them any rights, privileges, property or interests with respect to lakes, rivers, streams, or other water bodies within, passing through or bordering on the lands. (s.16)
7. Lands may be withdrawn from disposition for any purpose as long as the reasons for the withdrawal are noted on the withdrawal order; land may be set apart for use as national forests, game preserves, game sanctuaries, bird sanctuaries, public resorts or for any other similar public purpose. (s.23(a), (e))

Territorial Land Use Regulations

The Territorial Land Use Regulations direct the management and control of most land use activities occurring in the Yukon on federal Crown land. Notably, given an exception in the Territorial Land Use Act regarding mining, the Regulations have only limited applicability to mining activities. Land use permits may have associated terms and conditions which address a wide array of land protection issues including protection of archaeological sites, wildlife and fisheries habitat, time and location of work and use of equipment.

The *Territorial Land Use Regulations* are established pursuant to the *Territorial Land Use Act* and explain the process by which land use activities are managed and controlled in the Yukon. The regulations require individuals undertaking a variety of land use operations to obtain a permit prior to commencing their operations. The Regulations also outline a number of specific land use activities that must be avoided to protect various natural and cultural resources. The Regulations affect management of the river in the following ways:

1. The regulations do not apply to i) anything done by a resident of the Yukon in the normal course of hunting, trapping or fishing; ii) anything done in the course of prospecting, staking, or locating a mineral claim unless it requires a use of equipment or material that normally requires a permit; iii) land whose surface rights have all been disposed of by the Minister; or iv) a timber operation conducted according to the *Territorial Timber Regulations*. (s.6)
2. Unless expressly authorised to do so, no permittee can conduct land use operations within 30 m of known or suspected archaeological sites or burial grounds; excavate at a point that is below the normal high water mark of a river; deposit on the river bed any excavated material or place fuel or supply caches below the normal high water mark. (s.10)
3. Unless the terms and conditions of a permit so provide or the express written authority of an inspector has been given, all materials removed, except as occurs in rock trenching, must be replaced, levelled and compacted. As well, any material deposited into water or any alterations to the channel or riverbed must be removed/restored prior to the completion of the land use operation or prior to the commencement of spring break-up, whichever occurs first. (s.13)
4. No lines, trails or right-of-ways are to be cleared where an existing route can be used and any new lines, trails or right-of-ways must not be wider than 10m, unless expressly authorised in a permit. (s.14(1))
5. If any suspected archaeological sites or burial grounds are discovered, the permittee is required to immediately suspend activities and report the find to the appropriate government officials. (s.16)
6. Subject to permit conditions, all garbage, waste and debris from campsites must be removed by burning or burial and sanitary sewage is to be disposed of in accordance with the *Yukon Public Health Act*. (s.17)
7. Unless a permit directs otherwise, all land affected is to be restored, as nearly as possible, to the same condition as it was prior to commencement of the land use operation. (s.18)

8. Land use permits may be issued with terms and conditions addressing location, time at which work/undertaking may take place; type and size of equipment used; methods of work; location, type and capacity of facilities; use, storage, handling, and disposal of chemical and toxic materials; protection of wildlife and fisheries habitat; protection of objects and places of recreational, scenic and ecological value and other such matters necessary for protection of biological or physical characteristics of the area. (s.31(1))

Yukon Placer Mining Act

The Yukon Placer Mining Act enables the federal government to manage and control placer mining across the Territory. Subject to certain restrictions, placer mining can occur on any lands in the Yukon. Land may be withdrawn to prohibit or restrict placer mining activities. The Act contains few restrictions or reservations respecting land use on placer claims, noting, however, that compensation may be owing should the surface land be lawfully occupied by another party.

The *Yukon Placer Mining Act* establishes the placer mining regime, detailing procedures for acquiring, locating and recording claims, as well as delineating the title, rights and obligations of those who are granted placer claims. The Act may influence management planning and Heritage River designation in the following way:

1. Subject to a variety of restrictions, as stated in the Act, any individual over eighteen years of age may enter, locate, prospect and mine for gold and other precious minerals or stones on any land for either her/himself or for any corporation authorised to carry on business in the Yukon. Two of the key restrictions on locating claims are: i) where land has been set apart by the federal government to meet its obligations to First Nations, and; ii) where the federal government has issued an order prohibiting entry for the purposes of locating a claim or prospecting for gold or other precious minerals or stones. (s.17(1-2) and s.98)
2. Individuals who locate and mark claims in accordance with the Act can obtain a grant for the claim for one to five years. The holder of the grant is entitled to an absolute right of renewal, on an annual basis, if they work the claim to the value of $200/year and file a statement, within a specified period, detailing the work completed. (s.40(1) and (2))
3. Claim-holders, and those who have permission to record a claim as per the Act, may fish and shoot for their own use, subject to existing fish and game laws, cut timber and construct a residence for their own use, as well as having exclusive right to enter the land and benefit from the proceeds of work undertaken. (s.47(1))
4. Claim-holders are entitled to use water naturally flowing by or through the claim, if not otherwise lawfully appropriated for another use [only in accordance with the provisions of the *Yukon Waters Act*]. The amount used is limited to the amount necessary to the working of the mine, as determined by the Mining Recorder. (s.53)

Yukon Quartz Mining Act

The Yukon Quartz Mining Act enables the federal government to control virtually all aspects of hardrock mining. The Act contains few restrictions or reservations respecting land use on mineral claims, noting, however, the need for compensation if the surface land is lawfully occupied by another party. There are no provisions in the Act which provide for land withdrawals for the purpose of prohibiting or restricting quartz mining.

The *Yukon Quartz Mining Act* is designed to manage quartz mining in the Yukon, detailing processes and procedures of locating and obtaining mineral claims and by establishing the rights and obligations accorded to claim-holders. Relevant considerations are:

1. Any individual who is at least eighteen years old may enter, locate, prospect and mine for minerals on any vacant territorial lands and on any lands where the right to enter, prospect and mine for minerals is reserved to the federal Crown [only in accordance with the *Yukon Waters Act*]. Exceptions to this include, amongst others, land occupied by dwelling houses, Indian reserves, and national parks. (ss.12 and 14). In certain situations, where land is lawfully occupied by another, compensation may be required before mining activities commence. (s.15)
2. Claimholder is entitled to all minerals, together with right to enter, use and occupy surface land of claim area and the right to cut as much timber as is necessary for the working of the claim. (s.76(1))
3. Federal Minister may grant lease for up to five acres of unoccupied and unreserved federal Crown land, subject to certain limitations, for the purposes of establishing a mill-site. (s.22)

Fisheries Act

The Fisheries Act details the control, management and use of fish and fish habitat in areas of federal jurisdiction. There are no provisions which explicitly allow withdrawal of waterways for the purposes of protecting fish populations, although regulations may be made respecting conservation and protection of fish and spawning grounds. As well, the Act prevents the deposition of materials into waters where fish habitat may be altered or destroyed.

The *Fisheries Act* is a long and complicated statute governing all aspects of fishery management that lie within federal jurisdiction. Of most interest with regards to the management of the Bonnet Plume Heritage River Designation are provisions addressing fish habitat protection and pollution prevention. As appropriate, these are summarised below.

1. Unless authorised to do so, no person shall carry on any work or undertaking that results in the harmful alteration, disruption or destruction of fish habitat. (s.35)

2. Disposal of materials that would degrade or alter water quality such that fish or fish habitat are harmed (rendered deleterious) is prohibited. (s.36)

3. Regulations may be made for a variety of purposes, including conservation and protection of fish and spawning grounds and restricting all aspects of fishing and fishery management.

6.1.2 Yukon Legislation

Environment Act

The Environment Act enables the Yukon Government to regulate a variety of environmental concerns within their jurisdictional limitations. Included within the Act are powers to designate wilderness management areas and to control disposal of litter, which is defined broadly to consider, amongst other things, rubbish, garbage, bottles, packaging and containers.

The *Environment Act* addresses a variety of environmental issues and concerns that were previously not covered in the federal/territorial regulatory matrix respecting the environment. Within its jurisdiction, the Act enables the Yukon Government to regulate a variety of activities and undertakings including release of contaminants and handling of pesticides, special wastes and solid wastes. The Act also enables establishment of a development approvals and permitting system and implementation of integrated resource planning and management. Environment Act considerations include:

1. Agreements consistent with the *Environment Act* and its regulations may be made with other jurisdictions and organisations to co-operate on issues of managing trans-boundary resources, protection of biodiversity and environmental monitoring or to implement a resource management plan. (s52(1))

2. Wilderness management areas may be designated for the purposes of preserving the wilderness resource in the Yukon. Wilderness management plans are to be developed for each area. Regulations are to describe the selection process, selection standards, and management standards for wilderness management areas. (s.74). It is likely that a block land transfer of federal Crown land would have to be made to the Yukon Government to establish and effectively manage a wilderness management area designated under the *Environment Act*. In the absence of such a transfer, some type of administrative agreement may be used to enable the Yukon Government to manage the area in accordance with developed management plans.

3. Permits issued pursuant to the development approvals regime established in the Act (when implemented) may have attached any terms and conditions as the Minister considers necessary to prevent or mitigate an adverse effect on the environment, recalling the jurisdictional limits of the Yukon in this regard. (s.88(1))

4. Unless otherwise authorised, such as through a federal land use permit, it is an offence to abandon or discard litter in the Yukon. Litter includes any rubbish, refuse, garbage, paper, packaging, containers, bottles, cans, manure, human or animal excrement, sewage, the whole or part of an animal carcass, the whole or part of a vehicle or piece of machinery, construction material or demolition waste. (s.101)

Wildlife Act

The Wildlife Act enables the Yukon Government to designate protected habitat areas and wildlife sanctuaries to protect wildlife and wildlife habitat. At present there is no mechanism available through the Wildlife Act to protect habitat from damage unless it is included within a designate habitat protection area (Note - 1992 Act to Amend the Wildlife Act does enable this management action, however, the 1992 Act has not yet been brought into force).

The *Wildlife Act* establishes the management regime respecting wildlife in the Yukon, with particular emphasis on regulating hunting and trapping. Its relevance for management planning is as follows:

1. Protected habitat areas may be designated, by regulation, where necessary because of the uniqueness of an area, its sensitivity to disturbance, the likelihood of disturbance and its importance as habitat for any species or type of wildlife. (s.179(1)). A land transfer from the federal government to the Yukon Government or some type of administrative agreement enabling the Yukon to manage land use activities may be necessary to effectively protect designated protected habitat areas.

2. Regulations prescribing programs of land use for the preservation, maintenance and restoration of habitat on Crown land designated as protected habitat areas may be made by the Yukon Government. (s.179(3))

3. Subject to limitations specified in the *Wildlife Act*, beaver dams, and the dens, lairs or nests of any wildlife species are protected from damage and interference. Similarly, wildlife harassment and encouraging any wildlife to become a nuisance (e.g. feeding bears) is prohibited by the statute. (ss. 36 and 37)

4. Through amendment to Schedule I of the Act, wildlife sanctuaries may be designated to protect wildlife.

6.3 Appendix 3: Nacho Nyak Dun First Nation Final Agreement

From the First Nation of Nacho Nyak Dun Final Agreement, Chapter 11, Schedule B, pp. 164-166.

SCHEDULE B THE BONNET PLUME RIVER

1.0 Definitions

In this schedule, the following definitions shall apply.

"Board" means the Canadian Heritage Rivers Board established in accordance with the Canadian Heritage Rivers System Program.

"Canadian Heritage Rivers System Program" means the intergovernmental program of that name, as revised from time to time.

"Management Plan" has the same meaning as in the Canadian Heritage Rivers System Program.

"Ministers" means

(a) the federal Minister of the Environment; and

(b) the Ministers of the nominating agencies of Government, determined in accordance with the Canadian Heritage Rivers Program.

2.0 Nomination

2.1 Government shall submit to the Board a nomination document for the Bonnet Plume River before January 31, 1993, or as soon as practicable thereafter.

2.2 Government, after Consultation with the Mayo District Renewable Resources Council, shall prepare the nomination document in accordance with the Canadian Heritage Rivers System Program.

2.3 The Board shall:

2.3.1 consider the nomination; and

2.3.2 make a recommendation to the Minister(s), in accordance with the provisions of the Canadian Heritage Rivers System Program.

3.0 Management Plan

3.1 If the Board recommends that the Bonnet Plume River be designated as a Canadian Heritage River and the Ministers' accept the nomination:

3.1.1 the river shall be placed on the register of candidate Heritage Rivers; and

3.1.2 Government and the Mayo District Renewable Resources Council shall jointly prepare a management plan for the Bonnet Plume River.

3.2 Government and the Mayo District Renewable Resources council may establish a steering committee to assist in preparing the management plan and the membership on the committee shall be comprised of equal representation from Government and the Mayo District Renewable Resources Council.

3.3 The management plan shall establish the boundaries of the river management area and may address all matters relating to the development, management and use of the Bonnet Plume River, including:

3.3.1 conservation and management of natural and human heritage resources;

3.3.2 recreation use;

3.3.3 water quality and waste management; and

3.3.4 public information and interpretation.

3.4 The preparation of the management plan shall include a process for public consultation.

3.5 The management plan shall be submitted for approval to the Ministers of the nominating agencies in accordance with the Canadian Heritage Rivers System Program.

3.6 The approved management plan shall be lodged with the Canadian Heritage Rivers Board in accordance with the Canadian Heritage Rivers System Program.

3.7 Government and the Mayo District Renewable Resources Council may agree from time to time to review and recommend amendments to the approved management plan.

4.0 Designation and Review

4.1 Upon receipt by the Board of the approved management plan, the Ministers shall formally designate the Bonnet Plume River as a Canadian Heritage River.

4.2 The Board shall periodically review the status of the Bonnet Plume River as a Canadian Heritage River in accordance with the provisions of the Canadian Heritage Rivers System Program.

6.4 Appendix 4: Yukon Trans-boundary Agreement

The following is the description of the Primary Use Area of the Tetlit Gwich'in First Nation within the Yukon. Part of the Primary Use Area is within the Bonnet Plume watershed.

PRIMARY USE AREA (FORT MCPHERSON GROUP TRAPPING AREA)

Starting at 67°N Lat. 136°W Long and following the Yukon - Northwest Territories border to 65° 30' N Lat. then west to 137°W Long then north to 65° 40'N Lat. then east along the height of land line to the Hart River then to where the Hart River meets the Peel River then along Peel River to Daglish Creek then along Daglish Creek to 66°N Lat. and 137°W Long then to east to 136° Long and then north to the point of commencement 67°N Lat. 136°W Long.

Annual Report Checklist – BONNET PLUME CANADIAN HERITAGE RIVER

Listed below are values for which the Bonnet Plume River was nominated to the Canadian Heritage Rivers System, and activities that might in the future affect these values. Please check off those values that have experienced significant changes (natural or human induced), and potentially important activities that have occurred in the past year.

This is the report for the year of _____

Activity description is attached for each value checked.

1. OUTSTANDING RIVER VALUES

1.1 Natural Heritage Values

Geological Features: Representative of the Earth's History

- Mountains: Interface region of three mountain systems: Mackenzie, Wernecke and Richardson Mountains; _____
- a overlay of north-south trending strike faults and easterly trending folds and thrusts of the Mackenzie Mountains; _____
- the thickest and most extensive coal deposits in the Yukon, as well as other mineralization of iron, zinc and uranium; _____
- a proliferation of rock glaciers in the uplands of the tributary drainages; _____
- extensive representation of glacial landforms such as aretes, cirques and moraines; and, _____
- other. _____

Geological Features: Representation of Ongoing Processes:

- The erosional processes creating hoodoos along the middle sections of the river; _____
- the fluvial processes illustrated by extensive river braiding and old river courses along the broad valley bottom and canyon sections created by river action; _____
- the plentiful evidence of an active fire history in the area; _____
- the massive erosional slopes along the valley walls; _____
- the proliferation and size of avalanche tracks along the valley walls; and, _____
- other. _____

Areas of Exceptional Natural Beauty:

- The unique structure of the basin as a composite physiographic and structural depression in the Cordilleran Orogenic System of Northern Canada; _____
- the exceptionally large and visible landslide site just north of Bonnet Plume Lake; _____
- an internationally significant discovery of duck-billed dinosaur bones; _____
- year round ice free locations along the river; _____
- the mountain peaks, ridges, canyons and small lake setting of the Bonnet Plume, Quartet and Margaret Lake areas; and, _____
- other. _____

Rare, Endangered or Outstanding Concentrations of Plant and Animals:

- the presence of a large sedentary Bonnet Plume woodland caribou herd;
- the occurrence of rare vascular plants, *Papaver walpolei, Erigeron hyssopifolius, Cypripedium calceolus ssp. parviflorum,*and *Potentilla pensylvanica;*
- the occurrence of range extensions for the following vascular plants, *Boykinia richardsonii, Oxytropis campestris ssp. jordalli, Carex tillitolia,, Senecio sceldonensis, Goodyera repens,* and *Actaea rubra;*
- the occurrence of the range extension for tamarack near the mouth of Slats Creek;
- the concentrations of grizzly bears and,
- the occurrence of Beringia refugium relict lake white fish populations in Margaret Lake; and,
- other.

1.2 Cultural Heritage Values

First Nations Cultural Values

Including but not limited to:

- The area served as an important cultural link for the travel, meeting and inter-tribal trade of the Nacho Nyak Dun and Tetlit Gwich'in First Nations peoples;
- the area still functions as an important spiritual and cultural link for the Nacho Nyak Dun and Tetlit Gwich'in First Nations peoples;
- special places include traditional subsistence areas, camps, grave sites and sites of spiritual renewal; and,
- other.

Euro-Canadian Historic Values

- "Klondikers," trappers and prospectors traversed and occupied the valley (such as, prospector, Count V.E. de Sainville in 1983 and government geologist Charles Camswell in 1906); and,
- other.

1.3 Recreational Heritage Values

Water-based Activities

- Wilderness kayaking, canoeing, and rafting on the entire length of the river; fishing, nature study, wildlife viewing, photography, and human heritage appreciation; and,
- other.

Land-based Activities

- Unorganized wilderness hiking and camping;
- mountain climbing; and,
- other.

Interpretation

- diversity and high quality of scenic views;
- wilderness and nature appreciation;
- off-site interpretive values; and,
- other.

Visitor Services

- Unlimited opportunities for informal wilderness campsites; _____
- access via float plane at Bonnet Plume, Margaret or Quartet Lakes and via helicopter to the remainder of the area; _____
- public information; _____
- access; and, _____
- other. _____

2.0 RIVER INTEGRITY VALUES

2.1 Natural Integrity:

- River regime: no impoundments; _____
- minimal human impact on ecosystem with fairly intense use/remote/no road access; _____
- exist./potent. land-use constraints: no permanent dwellings, no shoreline dev.; and, _____
- intact natural aquatic ecosystem. _____

2.2 Historical Integrity

- River appearance little changed from historical integrity at the time of nomination; _____
- river's historical values not affected significantly by impoundments; _____
- minimal existing/potential land-use constraints on the river's artefacts/structures; and, _____
- water suitable for non-contact recreation. _____

2.3 Recreational Integrity

- River supports intensive rec. use; use impacts on river values minimal to-date; _____
- shoreline use impacts on rec. values are minimal to-date; and, _____
- water quality suitable for contact recreation. _____

2.3 General Integrity

- ecosystem: watershed approach to river management protects key rep. & unique elements; developments; _____
- land ownership – DIAND federal crown; Tetlit Gwich'in and Nacho Ny'ak Dun land claims sites; _____
- historic resources human history inventory; _____
- no special status or mgt. at time of nom.: note changes resulting from management integration of DIAND & YTG & Mayo Renewable Resources Council & Nacho Ny'ak Dun and Tetlit Gwich'in First Nations; and, _____
- water quality appears excellent. _____

3.0 WATER QUALITY PARAMETERS

3.1 Aquatic Life: Changes in levels of:

- organic substances: pesticides, herbicides, PCB's, etc.; _____
- inorganic substances: dissolved oxygen, nitrogen, phosphorous, heavy metals; _____
- physical characteristics: volume, temperature, turbidity, suspended solids; _____
- undesirable aquatic life; and, _____
- pH level. _____

3.2 Recreational Water Quality

- Bacteriological characteristics incl. fecal coliforms; _____
- aquatic plants; _____
- water clarity; _____
- floating debris, scum, etc.; _____
- objectionable colour, odor or taste; and, _____
- oil or petrochemicals on water, shoreline or river bottom. _____

4.0 ACTIVITIES POTENTIALLY AFFECTING OUTSTANDING RIVER VALUES

4.1 Yukon Renewable Resources/DIAND/Mayo Renewable Resource Council/ Nacho Nyak Dun and Tetlit Gwich'in First Nations

Planning Activities:

- Measures to maintain ecosystem e.g. designated protected areas, corridor boundary changes (at nomination = water shed), land ownership/use, legislation, regulations, territorial acts/policies; and, _____
- actions of implementing agencies (ref.4.4.1-3 work program). _____

Resource conservation and protection activities:

- Actions of implementing agencies (ref. 4.4.1-2 work program). _____

Visitor Use, services & facilities:

- Actions of implementing agencies (ref. 4.4.3 work program). _____

Administration/operations and maintenance

- Land use management, permit application process. _____

Monitoring & Review

- Annual Report, water quality; 5-year management plan review; monitoring by local users. _____

4.2 External Agency/Interest Group Activities

Activities of other agencies affecting the river:

- federal government: DIAND, PC, CWS, FEARO, Other; _____
- federal water survey; _____
- territorial agencies other than lead agency; _____
- regional communities/services Whitehorse, Mayo, Old Crow, Dawson, Tetlit Gwich'in, Ross River; _____
- industry: mineral exploration and claims; _____
- compatible social and economic activities: traditional uses, and commercial tourism; _____
- non-government organizations/interest groups - consultation/participation: (ref 4.4.1 - 4.4.3 work program): Mayo Renewable Resources Council; Business interests: mining, outfitters, Hunters and Trappers Assoc., and Yukon Tourism Assoc., Wilderness Tourism Assoc. of the Yukon; _____
- public media items on river: books, magazines, etc.; and, _____
- other external activities related to the river. _____

Bonnet Plume Canadian Heritage River Nomination Report Addendum

To: Members, Canadian Heritage Rivers Board

From: Jim McIntyre, Chair Bonnet Plume Steering Committee

Subject: Changes Between Nomination Document and Management Plan

The Nomination Document was submitted in 1992 and selection was based on priorities identified in the Systems Study of Candidate Rivers in the Yukon, prepared by Juurand and Associates in 1987, and subsequent study by Parks Research and Planning Inc. in 1988. Following acceptance of the nomination in 1993 by the Canadian Heritage Rivers Board, the Government of Yukon initiated management plan preparation.

One of the unique aspects of the Bonnet Plume nomination was the decision to put forward a proposal that included the entire watershed rather than the main stem of the river. It is also important to note that at the time the nomination document was put forward and the management plan initiated, two land claims (Nacho Nyak Dun, Tetlit Gwich'in) were being negotiated. The Tetlit Gwich'in claim was signed April 22, 1992 and the Nacho Nyak Dun claim finalised May 29, 1993, after the nomination document had been approved in principle. Schedule B of the Nacho Nyak Dun Final Land Claim Agreement confirmed First Nation support for the nomination and sets out the formal process to be followed in management plan preparation. This process has been followed and support for this Management Plan confirmed by the respective signatures of the governments involved.

One of the main criticisms of the nomination document was the perceived impression that the Bonnet Plume watershed was being presented as a pristine area, downplaying the known mineral potential. Exploration activity has occurred in the Bonnet Plume over the past 30 years on a rather sporadic basis but the footprint that has been left behind is relatively small. (It consists mainly of airstrips and a winter road). The nomination document was based on the information available at that time. As more information has become available it has been incorporated into the plan.

There is no need to revise the nomination document. While additional information has been collected during the past 5 years, none of it significantly reduces heritage river values. The Management Plan is consistent with the implementation obligations under the Nacho Nyak Dun Final Land Claim Agreement and accommodates the overlap interests of the Tetlit Gwich'in. It is also consistent with both First Nation desires to ensure that the water quality and wilderness values of the entire Peel River watershed are respected.

The Management Plan is designed to contribute to the larger regional planning framework, which has yet to be initiated. It will also ensure that the information needed to protect heritage river values is collected in a timely fashion and can be used in future assessments of specific resource development proposals. The implications associated with the presence of significant mineral occurrences within the watershed were not fully appreciated in 1992, for example, but are acknowledged in the new management plan.

This Management Plan recognises that resource planning and management in the Yukon are presently in transition. Devolution of resource management responsibilities from the federal to territorial government is occurring at the same time as land claim implementation. The Bonnet Plume will likely be part of a larger regional planning area. Thus it is important that the Management Plan contribute to, but not prejudice the process or outcome of that exercise.

The following is a discussion of the changes and considerations that have been undertaken since submission of the nomination document and completion of this management plan.

- In the Nomination Document, the main stem of the Bonnet Plume River was nominated along with the entire drainage basin. It was anticipated that the boundary might be modified by the land claim settlements or as a result of public discussion of the proposed management plan. The majority of respondents favoured retention of the watershed boundary although there is a split between those who want to see the entire watershed adopted as a protected area and those who wish to retain the option for future resource development. The planning team concluded that such a decision should be made in the context of regional planning with specific proposals covered by the new development assessment process. The plan's responsibilities should be to ensure the information needed for these processes is available and heritage river status not be compromised. The watershed boundary has not been changed.

- The Management Plan respects the specific obligations of government under the land claim agreements. The Bonnet Plume will be treated as a special management area. The Canadian Heritage Rivers System (CHRS) process was designed to accommodate non-traditional management arrangements and land management approaches. This Management Plan uses zoning in a non-traditional way by designating research zone priorities and setting out a mechanism to identify and respond to limits of acceptable change. This approach recognises today's realities in terms of restricted government resources and identifies opportunities for partnerships to meet plan objectives.

- Both the Tetlit Gwich'in and Nacho Nyak Dun Final Land Claim Agreements called for the establishment of a Peel River Watershed Advisory Committee for a two year period. The Committee was mandated to make recommendations regarding water management within the entire watershed, suggest how regional planning might be undertaken and identify the need for additional special management areas. Six candidate protection areas were identified within the Bonnet Plume watershed. The Committee recommended that these areas be protected and conserved through "appropriate mechanisms". They also recommended that a regional plan be prepared for the entire Peel River watershed.

  The Bonnet Plume water quality study, initiated in 1997, is also consistent with the Peel River Watershed Committee's goals to protect water quality and meet CHRS guidelines to develop appropriate water monitoring procedures.

- In 1992, the human heritage values in this area were less well-known and only one of the four CHRS human heritage selection guidelines could be met due to a lack of documented information. In 1996, GeoHeritage Planning Consultants prepared a cultural thematic framework which could be applied to all CHRS rivers. This study was followed by a report in March, 1997 which included a preliminary assessment of the cultural heritage values of the Bonnet Plume River. The authors of the Management Plan have refined the GeoHeritage Planning assessment using local knowledge.

  The Management Plan acknowledges that the CHRS selection guidelines for human heritage values reflect a non-First Nations' perspective of history and human occupation. To rectify this deficiency, the plan identifies what further work is needed to adequately reflect First Nation interests. Notwithstanding this deficiency, 17 CHRS cultural theme categories are present representing 8 broad cultural heritage values. The new information is sufficient to now justify inclusion on the basis of cultural heritage value too.

  Since preparation of the Bonnet Plume Nomination Document, the Gwich'in Social and Cultural Institute completed a traditional use and knowledge study of the Arctic Red River as part of that Heritage River Management Plan. They anticipate undertaking similar work for the Peel River and a section of the lower Bonnet Plume within Gwich'in traditional territory.

- The Mayo District Renewable Resources Council completed a three year Integrated Game Management Plan in 1993. The Plan focuses on the habitat and management intervention needs of moose, caribou, wolf, sheep and grizzly bear populations, and supports the designation of the Bonnet Plume as a heritage river. Systematic inventories of the fish and wildlife resources of the Bonnet Plume watershed are still needed for ecosystem management purposes and this deficiency is addressed in the implementation workplan.
- In 1992, water resource information was incomplete and DIAND Water Resources conducted a reconnaissance level survey of the main stem of the river in 1997. As stated earlier, this will be used to set appropriate testing and monitoring parameters for the river as required upon CHRS designation.
- Canadian Parks and Wilderness Society (CPAWS) has spent the last two field seasons working on producing a satellite map of vegetation cover and wildlife habitat in the Bonnet Plume watershed. During the latest field season, a range extension was identified for the Least Chipmunk and two new breeding pairs of peregrine falcons were seen. The research team felt this was a positive indication of a healthy ecosystem. During the winter of 1998 CPAWS plans to work with the Gwich'in Land and Water Board to complete the satellite map and vegetation report for the Bonnet Plume River.
- Since 1992, further investigation has been made into the mineral and energy resource potential in the watershed. More information is now available. The presence of significant mineral occurrences in the heart of the drainage basin has been confirmed, including oil and gas, coal, and base metals. However, given their location, distance to markets and lack of supporting infrastructure, these resources are not likely to be exploited in the foreseeable future. The Management Plan acknowledges this potential. It identifies the issues and information that needs to be gathered to protect heritage river resource values and facilitate regional planning. The information will also be collected in a manner that allows it to be used in the preparation and assessment of any individual proponent initiative. In conclusion, new data has been collected which reinstates the heritage values of the river. The Management Plan responds to the issues and focuses on additional data collection to facilitate future regional planning and development assessment.